

**TG8000**  
**Multiformat Test Signal Generator**  
**Release Notes**

This document supports firmware version 1.7.

[www.tektronix.com](http://www.tektronix.com)



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# Release notes

This document describes new features, improvements, and limitations of firmware version 1.7 for the TG8000 Multiformat Test Signal Generator.

## New features

### GPS7 module

- The module 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 module 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 an SDI7 module is installed, the SDI7 embedded timecode (when enabled) also includes the SMPTE309 fields. However, the timecode outputs for any installed BG7, HD3G7 and HDVG7 modules do not include the SMPTE309 time code data.

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.”

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**NOTE.** *The BG7, GPS7, HD3G7, HDVG7, and SDI7 modules have Time Zone Offset adjustments which allow the module outputs to use a different offset than the one used as the master time-of-day in the GPS7 module. 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 GPS7 module 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.*

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- The Status display for the module now includes the received ST309 time zone and DST data (if present).

### **SDI7 module**

- 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 module main 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.

- The burnt-in time code (BITC) display that can be added to any test pattern generated from the outputs now has a second line that can be enabled to show the date in the format YY/MM/DD.
- Because of the new SMPTE309 time code data feature on the GPS7 module described above, the SDI7 embedded timecode (when enabled) also includes the SMPTE309 date, time-zone offset, and DST enabled/disabled fields. The content of these fields depends on the current SMPTE309 mode setting on the GPS7 module (Ignore, Use As Input, or Use As Input/Output).

## General limitations

This firmware release has the following general limitations. Please check the Tektronix Web site ([www.tek.com/software/downloads](http://www.tek.com/software/downloads)) for any firmware updates to the TG8000 generator.

### TG Setup software

In setting signal formats for the Black 2 and Black 3 outputs of the AGL7 module, do not select Black 2 = HD sync (same as Black 3) and Black 3 = BB (same as Black 2) simultaneously, while Frame Reset 1 is set to 2.997 Hz. This operation makes the Frame Reset 1 unstable. If this is the case, reset the system by recalling the Power On Default setting or a preset.

### USB port

- When you mount a USB drive, the SDI output signal from an HDVG7 module may briefly unlock. This problem only occurs on HDVG7 modules with serial numbers B013412 or earlier, or HDVG7 modules with a serial number that begins with the letter 'J'. The SDI outputs from DVG7, HD3G7, and SDI7 modules are not affected by the mounting of a USB drive.
- The TG Setup application cannot be used for remote configuration while files are being restored from a USB drive. Wait until the restore operation is complete before opening the TG Setup application and connecting to the TG8000 generator.

### Firmware upgrades

- When the TG8000 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 the SDI7 module, can also include text and font files. The standard set of factory installed signal files, logo files, and SDI7 module 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 UTILITY 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 UTILITY menu to restore your user created files.

- If you have loaded the TG8000 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 version, you need to delete some of the test signal or frame picture files and then perform the upgrade.

### 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.

**Changing output formats with open menus**

Some front-panel menus and status displays are dependent on the frame rate of the currently selected output format. If you open a submenu and press the FORMAT button to change the frame rate, the submenu will not be refreshed until it is exited and reopened.

**Assigning a signal and frame picture to a front-panel button**

When you assign a downloaded signal to a front-panel button, do not assign different format signals to the same button.

Do not assign a signal set to a button that corresponds to the signal that is currently being output. Also, do not assign a signal set to a signal button while the message “No Signal Set Assigned” is displayed. If you reassign a signal set to the OTHER button, perform the reassignment while a signal that is assigned to a button other than the OTHER button is output.

**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).

**Setting the genlock source on the AGL7 module**

If you change the frame reset period in the AGL7 module after the genlock source is set to CW, the frame reset may not be selected properly. If this is the case, set the frame reset to CW.

**Timing range of the AGL7 module**

The TIMING menu for the AGL7 module will allow output timing adjustment beyond  $\pm \frac{1}{2}$  frame of the current format.

### Installing or upgrading an AGL7 module

If you move an AGL7 module from a TG700 mainframe to a TG8000 mainframe, or if you move an AGL7 module from a TG8000 with firmware version 1.2 or below to a TG8000 with firmware version 1.3 or above, the FPGA of the AGL7 module will be automatically updated when the instrument boots. This will also occur if you upgrade a TG8000 with an AGL7 module installed, and if the firmware version in the TG8000 is 1.2 or below.



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**CAUTION.** *To prevent an update failure of your AGL7 module, do not remove or cycle power on the TG8000 while the instrument is rebooting after installing an AGL7 module or after an upgrade from firmware version 1.2 or below. The FPGA update on the AGL7 module takes about three minutes and there is no indication on the front panel that the AGL7 module is being updated. If power is interrupted before the FPGA update is complete, the module will need to be returned to Tektronix for service.*

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### Daylight Savings Time (DST) scheduler system on the GPS7 module

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 TG8000 generator. 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 on the GPS7 module**

- 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 SDI7 module Channel 1 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).

**Embedded audio of the HDVG7 module**

- Embedded audio for 720 23.98p/24p formats are not supported for the HDVG7 module, even though they can be selected in the menus.
- The first user data word in the audio control packet (containing the Audio Frame value) has incorrect parity when the frame count is 1, 2, or 4.

**Y to GBR convertor mode  
of the HDLG7 module**

If the output format is 2K and the Converter mode is set to Y to GBR, changing operating mode by selecting a test signal will cause an unexpected black and white signal to be generated. To correct the test signal, press the OTHER button until Normal is selected, and then press the test signal button.

**25/29.97/30 Hz segmented  
frame format for the HDLG7  
module**

The HDLG7 module does not have format selections for 1080PsF at 25 Hz, 29.97 Hz, or 30 Hz. These formats are almost identical to 1080i (interlaced) formats at 50 Hz, 59.94 Hz, and 60 Hz respectively; these format settings can be used with progressive segmented signals. However, note that the SMPTE 352M payload identifier for the output signal will show an interlaced signal format, even when the HDLG7 module is converting a single link progressive segmented input signal to dual link.

**Converter mode of the  
HD3G7 module**

- Infrequently, the module will fail to up-convert the input HD-SDI signal. If no output is seen, the problem can be corrected by selecting a different test signal and then switching back to converter mode.
- The trigger output cannot generate a frame pulse or line pulse when the module is in converter mode.
- The moving picture and video component functions do not apply to up-converted output signals.
- When a Level B format is selected for the up-converted 3 Gb/s output signal, embedded audio from the input HD-SDI signal will be copied into both virtual links. Therefore, up to 32 channels of embedded audio can appear on the 3 Gb/s output.
- The HD3G7 module does not reformat SMPTE 334 Caption Distribution Packets in converter mode. Therefore, when up-converting from 1080i 59.94 Hz to 1080p 59.94 Hz, for example, the output will contain CDP data in alternate frames, each with 40 bytes of caption data, instead of CDP data in every frame, each with 20 bytes of caption data.
- Up-conversion to a Level B fast progressive format may result in mis-ordered Caption Distribution Packets in the stream of output frames.

**SDI equalizer test signal of the HD3G7 and SDI7 modules**

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 of the HD3G7 and SDI7 modules**

The HD3G7 and SDI7 modules 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 *TG8000 SW Library and Documentation DVD* that was supplied with the instrument.

**SDI7 multi-language support**

Languages that require combined glyphs in order to be represented may not be correctly rendered in the Text ID display on the SDI7 module.

**Multiburst signal motion on the SDI7 module**

Do not set a Multiburst signal in motion on the SDI7 module. Otherwise, a corrupted signal will be generated.