



TG700
TV Signal Generator Platform
Release Notes

This document supports firmware version 5.64.

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Release notes

This document describes new features, improvements, and limitations of firmware version 5.64 for the TG700 TV Signal Generator Platform.

This release repairs defects found in earlier versions of the TG700 firmware.

New features

This release introduces the following new features:

GPS7 module GPS constellation selection

A new GPS CONSTELLATION menu selection appears in the GPS SETUP menu only for GPS7 modules with a GPS/GLONASS receiver that are installed in a TG700 with firmware version 5.64 or later. You can select **GPS Only**, **GLONASS Only**, or **GPS & GLONASS**

Earlier versions of the GPS7 module included a receiver that could use only GPS signals. Later versions of the module include a receiver that can use GPS and/or GLONASS signals.

GPS module version readout

The **UTILITY : VERSION INFO (H/W)** menu provides readouts containing version information about the instrument hardware. For the GPS7 module, the readout now includes the hardware version of the GPS receiver module. 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 8, *GPS receiver versions on GPS7 module*.)
- 3023. This value indicates that the receiver supports GPS and GLONASS signals.

SDI7 module logo overlay with Moving Picture enabled

On test signals generated by the SDI7 module, the logo overlay will remain in the user-set location even when the Moving Picture feature is active. However, the logo overlay will move with the picture when a Frame Picture signal is selected. This change was implemented with firmware version 5.62.

SDI7 module audio mute and disable controls for the secondary output

Two new selections have been added to the configurations for the secondary output on the SDI7 module: Black (with no audio) and Black (with audio muted). If embedded audio is enabled for the SDI7 module, the audio on the secondary output (lower BNC) will be controlled by this setting. This change was implemented with firmware version 5.62.

**Module compatibility
between the TG8000 and
TG700 mainframes**

Each of the modules that was designed to operate in the Tektronix TG700 TV Signal Generator Platform will also operate in the TG8000 mainframe.

GPS7 module. The adjustment of the mainframe oscillator depends on the mainframe in which the GPS7 module is installed:

- **TG8000 mainframe:** You need to set only the internal frequency of the mainframe oscillator. Refer to the *TG8000 User Manual* for more information (Tektronix part number 071-3036-XX).
- **TG700 mainframe:** You need to set the internal frequency of the mainframe oscillator and characterize the mainframe oscillator frequency as a function of voltage. Refer to the *TG700 User Manual* for more information (Tektronix part number 071-1970-XX).
- **GPS receiver:** There are three versions of the GPS receiver as described below.
 - **3002.** This receiver supports GPS signals only and was replaced by the 3015 receiver. This receiver is compatible with both the TG8000 and TG700.
 - **3015.** This receiver supports GPS and GLONASS signals and was replaced by the 3023 receiver. There are some reported limitations with this receiver. (See page 8, *GPS receiver versions on GPS7 module*.) The TG8000 must have firmware version 1.6 or above installed and the TG700 must have firmware version 5.64 or above installed for this receiver to operate.
 - **3023.** This receiver supports GPS and GLONASS signals. The TG8000 must have firmware version 2.5 or above installed and the TG700 must have firmware version 5.64 or above installed for this receiver to operate.

SDI7 module. The behavior of the Moving Picture function depends on the mainframe in which the SDI7 module is installed:

- **TG8000 mainframe:** When Moving Picture is enabled, the circle and text overlays remain static regardless of the signal type (standard test signal or “frame (.BMP) picture”). However, the logo overlay remains static for only standard test signals but continues to move when used with a “frame (.BMP) picture.”
- **TG700 mainframe:** When Moving Picture is enabled, the circle and text overlays remain static and the logo overlay moves regardless of the signal type (standard test signal or “frame (.BMP) picture”).

Documentation changes

The following documentation changes cover the new features that are being introduced with this release.

GPS7 module GPS constellation selection

A new GPS CONSTELLATION menu selection appears in the GPS SETUP menu only for GPS7 modules with a GPS/GLONASS receiver that are installed in a TG700 with firmware version 5.64 or later. (See Figure 1.)

Use the left (◀) or right (▶) arrow button to select **GPS Only**, **GLONASS Only**, or **GPS & GLONASS**. If your antenna supports both GPS and GLONASS signals, it is recommended that you use the GPS & GLONASS setting to gain more timing accuracy.

NOTE. After you configure the GPS constellation, it is strongly recommended that you save the module settings to the Power On Default preset. The Power On Default preset saves the configuration parameters in both the TG700 mainframe and the installed modules, which helps the instrument power up faster in the event of a power outage or interruption.



Figure 1: GPS constellation selection in the GPS SETUP submenu with 5.64 firmware

SDI7 module MOVING PICTURE submenu

NOTE. The following information replaces the contents of the NOTE in the MOVING PICTURE Submenu section for the SDI7 module in the TG700 User Manual (Tektronix part number 071-1970-07).

The Moving Picture function is not available with zone plate or multiburst signals. However, zone plate signals may be defined with motion in the zone plate parameters. (See page 3-260, Modifying a Zone Plate Signal.)

The Moving Picture function is enabled whenever the H Step or V Step parameter is set to a value other than 0.

When Moving Picture is enabled, the circle and text overlays remain static regardless of the signal type (standard test signal or “frame (.BMP) picture”). However, the logo overlay remains static for only standard test signals.

SDI7 module SECONDARY OUTPUT submenu

NOTE. The following information replaces the description of the *SECONDARY OUTPUT Submenu* for the SDI7 module in the TG700 User Manual (Tektronix part number 071-1970-07).

Use the left (◀) or right (▶) arrow button to select the test signal to be the output for the secondary (Signal 1B or Signal 2B) BNC connector for the selected SDI7 channel. Press the **ENTER** button to confirm the selection. The following figure shows the SECONDARY OUTPUT submenu.



Figure 2: SDI7 module SECONDARY OUTPUT submenu

Test Pattern. When set to Test Pattern for channel 1, the Signal 1A and Signal 1B connectors will output the same test signal. The same is true for the channel 2 connectors when Test Pattern is set as the Secondary Output selection for channel 2.

Black. When set to Black for channel 1, the Signal 1B black signal is the same format and sample structure as the Signal 1A output. The same is true for the channel 2 connectors when Black is set as the Secondary Output selection for channel 2. The output signal will contain audio if embedded audio has been enabled for that output channel.

Black (No Audio). Operates like the **Black** selection above, except the output signal contains no audio content.

Black (Mute Audio). Operates like the **Black** selection above, except the output signal contains muted audio if embedded audio has been enabled for that output channel.

SDI7 module OUTPut<x>:BLACK remote command

NOTE. The following information replaces the description of the :OUTPut<x>:BLACK remote command for the SDI7 module in the TG700 Programmer Manual (Tektronix part number 077-0139-06).

:OUTPut<1|2>:BLACK TEST|BLACK|BLK_NOAUD|BLK_MUTE

Sets the signal for the active video of the second output (i.e. SIGNAL 1B or SIGNAL 2B) of the specified generator channel. When TEST is selected, the second output is a copy of the test pattern on the first output (i.e. same as SIGNAL 1A or SIGNAL 2A respectively).

When any one of the three Black signals is selected, the second output is digital black (0% flat field). Select BLACK to include audio content at the default volume. Select BLK_NOAUD to remove audio content from the Black signal. Select BLK_MUTE to include audio content that is muted in the Black signal if embedded audio is enabled for that output channel.

For any of the four settings, the ancillary data (time code, VPID, and user-defined data) will be the same for both outputs of the specified generator channel.

General limitations

This release has the following general limitations:

TG700 mainframe memory requirements

With software version 5.6.X, the TG700 mainframe must have at least 32 MB of memory installed. If you intend to install frame picture files (*.pic), created by the Frame Picture Generator application for the DVG7, HDVG7, AVG7, or AWVG7 modules, or if you intend to install bitmap frame picture files (*.bmp) for the SDI7 module, then the mainframe must have 64 MB of memory installed.

Software upgrades

If your existing mainframe has 32 MB of memory and you have loaded the TG700 memory with frame picture files, you may not be able to upgrade the instrument to software version 5.6.

If you receive a memory error while attempting to upgrade the software version, you need to either delete some of the frame picture files or upgrade your instrument to 64 MB of memory.

Memory upgrades	<p>Option FP provided extra memory, which allowed the TG700 mainframe to support frame picture images. This option is no longer necessary for new TG700 mainframes.</p> <p>If you have an older mainframe with less than 64 MB of memory, you can increase the memory in your mainframe to 64 MB by ordering the following upgrade kit: 040-1698-xx. Contact your local Tektronix representative for more information.</p>
TG7 Setup software	<p>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.</p>
TG7 Comm software	<p>Do not change or delete any file names or folder names other than those downloaded by users (signal files, sequence files, and preset files). Doing so can cause the instrument to operate in an unexpected manner.</p> <p>You can change the names of user files (signal files, sequence files, and preset files) after you have downloaded them into the TG700 mainframe. Remove and reapply power to see the updated names on the mainframe.</p>
Resetting an output signal	<p>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.</p>
Changing output formats with open menus	<p>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.</p>
Setting the genlock source	<p>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.</p>
Assigning a signal and frame picture to a front-panel button	<p>When you assign a downloaded signal to a front-panel button, do not assign different format signals to the same button.</p> <p>Do not assign a signal set to a signal button of 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.</p>

DHCP service on instrument power-up	<p>When the instrument is configured for DHCP service and then is powered down, the service may not always restart automatically when the instrument is powered up. If this is the case, use the NET SETUP submenu to first disable DHCP, and then to immediately re-enable DHCP.</p>
Multiple timecode formats	<p>Frequent changes to output formats can result in instability on those outputs. Disturbances to PAL output signals can be prevented by setting any output to PAL as a power-on preset, and then keeping any output set to PAL at all times.</p>
Time of day changes for timecode outputs	<p>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.</p> <p>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).</p>
Daylight Savings Time (DST) scheduler system	<p>The DST scheduler system applies the DST offset even if the Time-Of-Day (TOD) source is set to “VITC Input” or “LTC Input”. In both cases, the offset is applied whether or not a valid VITC or LTC input signal is available. For proper DST scheduling, you need to manually enter the date and time in the TOD menu and ensure that the instrument has valid time information.</p> <p>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 time of day clock (which starts at fixed default and may not be correct) 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.</p> <p>If the TOD source is set to “Internal” when the instrument is powered on, you will need to change the TOD source to “VITC Input”, “LTC Input”, or “GPS Signal” and then back to “Internal” in order to enable the DST scheduler system with “Internal” as the TOD source. Check the system time of day and adjust as needed to ensure that it is correct before enabling the DST scheduler in “Internal” mode.</p>
Timing range of AGL7 module	<p>The TIMING menu for the AGL7 module will allow output timing adjustment beyond $\pm \frac{1}{2}$ frame of the current format.</p>

**GPS receiver versions on
GPS7 module**

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). TG700 firmware version 5.64 and above contains a fix for this problem.

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.*

**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 Converter 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	<ul style="list-style-type: none">■ 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.
Embedded audio of the HD3G7 module in Converter mode	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.
Closed caption data with the HD3G7 module in Converter mode	<ul style="list-style-type: none">■ 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.
HD3G7 module presets	If a preset was made with an earlier version of the HD3G7 module and recalled with version 5.55 or later, the test signal selection is not restored. All other settings are restored normally.
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 <i>TG700 Software Library and Documentation DVD</i> 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.

SDI7 response time The response time for loading a frame picture or logo display, or for loading text and/or circle overlays will vary depending on the size of the picture/data file and the number of characters in the text overlay.

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.