



SPG8000A
Master Sync / Clock Reference Generator
Release Notes

This document supports Firmware Version 3.4.

www.telestream.net



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Release notes

This document describes new features, improvements, and limitations of Firmware Version 3.4 for the SPG8000A Master Sync / Clock Reference Generator.

The Version 3.4 firmware upgrade package can be downloaded from www.telestream.net/video/resources.htm. The package consists of a ZIP file containing two files: firmware.pkg and transfer.exe. The transfer.exe program is used when upgrading the SPG firmware by a network connection. Alternately, a USB memory device can be used for the upgrade procedure. Complete instructions can be found in the SPG8000A User Manual.

New features

NTP client for time reference

The SPG can now use an external NTP server as the time reference, when the frequency reference is set to black burst (NTSC or PAL) or continuous wave (CW) input, or if it is set to internal mode. Select "NTP Input" from the TIME : TIME OF DAY source menu. This mode is useful in situations where the GPS signal is unavailable or when VITC or LTC inputs are not available for the time reference. The IP address(es) for one or two NTP servers can be set from the SYSTEM : NTP SERVER ADDRESS menu. If the SPG does not get a response from the first server, it will use the second server. The time is set once, when the server address is selected; the NTP server is not polled periodically. The time can be resynchronized at any time by selecting ENTER from this menu, but this would usually cause synchronization shock in the SPG's outputs because the time of day is reset.

Time output when not using accurate time of day

When the time reference is set to Internal or NTP, and the reference source is NTSC/PAL or CW, the output time (for generated PTP, LTC, and VITC) is adjusted (within $\pm \frac{1}{2}$ frame) to match the phase of the reference input. This ensures that the phase for black outputs generated on downstream SPGs that are PTP slaves to this PTP master match the phase of the original reference input to this SPG and the black outputs of this SPG.

Password for Web Interface

The Web Interface now requires a password before any configuration values can be changed. The web page is still viewable in read-only mode so that status information and current configuration settings are visible without having to log in. A new "Log In" button appears on the top right of the web page. The username is fixed to "admin" and the password is set from the SYSTEM : WEB USER INTERFACE : PASSWORD menu from the front panel.

GPS antenna cable compensation

The SPG is now able to compensate for the length of the cable from the external GPS antenna to the receiver inside the unit. When the reference source is set to "GPS Signal," the REFERENCE : GPS CABLE DELAY menu can be used to adjust the timing delay, up to a maximum of 50 microseconds. The propagation delay depends on the cable type but is typically 5 nanoseconds per meter.

Improved Event Log reporting

In version 3.4, several event log messages have been updated for better readability, for example, the GPS/PTP FOM event type will show "Low Signal" instead of "VAL=1".

New and updated HDR test patterns

For the SDI outputs, a new "BT.2111-1 S-Log3 68.5%" test signal has been added to the TEST SIGNAL : COLOR BAR menu. Additionally, the HLG1000 75% and PQ Narrow 58% test signals have been updated to BT.2111-1.

Additions to Web Interface

On the GPI Settings section of the System tab of the Web Interface, checkboxes have been added to configure output alarms for PTP grandmaster changes from active to non-active.

On the Reference tab, a Frame Reset pull-down menu has been added when the reference source is set to CW.

Fixed firmware limitations

These limitations are fixed in this firmware version:

Fan Fault and Loss of diagnostics

In previous versions, a false fan alert may have been reported under rare circumstances, especially if remote access through the Web Interface was heavily utilized. This issue has been fixed.

System reboot after heavy use of SCPI commands

In previous versions, the system might occasionally reboot after receiving continuous commands on the SCPI interface (port 5000). This has been fixed in version 3.4.

PTP Master briefly active during boot

When the PTP option is present, the system would start PTP operation during the boot process prior to the reference (GPS, genlock, etc.) being locked. This would result in a brief moment when an incorrect time was used in output PTP messages. In version 3.4, no PTP messages will be output until the system is locked.

GPS timing errors caused synchronization hits

Occasionally, in previous versions, the internal GPS receiver may report a spurious timing difference of more than 100ns, which would result in a brief glitch in synchronization. In version 3.4, a filter has been added to remove these spurious timing spikes so they are not used by the SPG's sync system.

General limitations

This firmware release has general limitations, which are outlined in this section. Check the Telestream website (<https://www.telestream.net/video/sync-and-reference-generators.htm>) for any firmware updates to the SPG8000A generator.

Firmware upgrades

- When the SPG8000A 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 SPG8000A 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.

- Clear the cache on the browser after an update to the Instrument code. This is necessary to get the new features on the Web Interface.

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 (for example, 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, then return to the STATUS : ALERT menu.

Resetting an output signal

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

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 SPG8000A 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 / remote control

Some performance issues have been observed when the SPG8000A Web Interface is used with Internet Explorer 8. The use of newer browsers is recommended.

Clear the cache on the browser after an update to the Instrument code. This is necessary to get the new features on the Web Interface.

In some instances, the Web Interface will not recover well from a power cycle on the instrument. If this occurs, close the Web Interface windows, cycle the power on the SPG, then clear the cache before restarting the Web Interface.

It is recommended to only have a single external client use the SCPI command interface on TCP port 5000 at any time.

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.

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 SPG8000A 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). SPG8000A Firmware Versions 2.1 and later contain a fix for this problem.

Receiver Version 3015 with Software 1.06 may occasionally see a small leap second change that lasts for 12.5 minutes. To prevent this from affecting the operation, configure the instrument to defer applying the leap second until a local time such as 1 or 2 AM. Ensure the local time is not the same as UTC midnight, so that the change is deferred at least an hour.

NOTE. *SPG8000A Firmware Version 2.2 or later must be installed to view the GPS receiver firmware version.*

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 Teletream 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. SPG8000A Firmware Versions 2.2 and later contain a fix for this problem. It is strongly recommended that SPG8000A Firmware Version 2.2 or later 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 later installed. Previous SPG8000A Firmware versions have issues that will cause operational problems with the 3023 Version GPS receiver.

GPS receiver Version 3023 with Software Version 1.03. If receivers of this combination are inside the footprint of the QZSS constellation, they may not maintain lock correctly. Instrument software versions 3.0.1 and later will update most instruments to 1.04 or later module code.

In rare cases, the software update from version 1.03 to 1.04 may not work the first time and the GPS receiver version will display as 0000. If this happens, remove the power to the system to force a reboot.

Contact a local Telestream representative to receive an upgrade kit if a system is not able to update to 1.04.

GLONASS only operation. The GLONASS signal incorporates leapseconds in a different way than the GPS system, so the GPS signal is required for correct operation. If GLONASS only mode is selected, then it will be converted internally to GLONASS plus GPS. The leap seconds will not be maintained correctly if the antenna used only provides the GLONASS signal.

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 Telestream website (<https://www.telestream.net/video/sync-and-reference-generators.htm>).

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.

Multi-burst signal motion. Do not set a Multi-burst 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 SPG8000A 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.

Option PTP Composite reference for PTP master. Genlock to PAL Burst mode with VITC or 25 Hz LTC is fully functional. Genlock to NTSC Burst with VITC or 30 Hz Drop Frame LTC basically works but is not fully accounting for the drop frame compensation. Therefore, there may be a few frames of error in the time which is decoded by the slave device and the time code on the outputs may not be exactly aligned until the instrument has executed a scheduled jam sync.

Additionally, the daily jam sync of an NTSC reference may cause a slight shift in the time sent by the PTP master. Therefore, for composite operation it is recommend to use a PAL reference signal.

ST2059-2 leap seconds. The ST2059-2 Synchronization Metadata message leap seconds fields are not fully implemented. The other fields in these messages are working correctly.

ST2059-2 metadata. The PTP message with the SMPTE ST2059-2 meta data will not contain the advance notice for a leap second change.

Slave lock time. The slave takes about 2.5 minutes to lock.

Announce message interruption on reference change. During a reference source change the master may stop sending announce messages for a brief time. This can cause the slaves to search for another master and restart the lock process. This will happen more frequently at high announce rates where a short time will exceed the selected announce timeout count.

This effect can be reduced by using a lower announce message rate or by increasing the announce timeout count on all the devices on the domain.

Factory preset or firmware upgrade. After recalling the Factory preset or performing a firmware upgrade and then changing to PTP slave mode operating in Mixed mode without negotiation, the slave device will actually be requesting negotiation. Setting the Master IP address into the AMT of the slave unit will correct this problem. When operating the instrument from a preset that includes the AMT setting, the operation will be correct.