



SPG9000

Timing and Reference System

Release Notes

This document supports firmware version 4.2

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Release Notes

This document describes the new features, fixes, improvements, and limitations of firmware version 4.2 for the SPG9000 Timing and Reference System.

Product Updates

Upgrades All SPG9000 units are eligible for upgrading to version 4.2 using the standard upgrade process. If the SPG9000 is currently using version 4.1, the remote upgrade process added in that release may be used to upgrade to version 4.2.

All customers with releases 4.0 and earlier are strongly encouraged to upgrade as soon as possible to take advantage of the bug fixes and stability improvements. Customers currently using version 4.1 do not necessarily need to upgrade unless they require any of the new features.

Downgrades There are currently no downgrades possible from version 4.2 to 4.1 or earlier.

New Features

Version 4.2 is a minor release that adds some enhancements to aid system configuration and troubleshooting, plus several other fixes and improvements. See the user manual for details about the following functions and their operation:

- The File Manager has a new Captures tab from which you can record .pcap files for the PTP and IP ports, for control-plane protocols such as PTP, DHCP, ICMP, LLDP, and DNS. These files can be downloaded to your computer and opened in Wireshark for offline analysis.
- In addition to the remote syslog server, the SPG9000 can also save syslog files to memory and downloaded to your computer for examination. These files are saved in volatile storage to preserve the life of non-volatile storage on the instrument.
- A Service Report package can be saved in a single .zip file for convenient interactions with the Telestream Support team. The Service Report contains the complete configuration and current status of the SPG9000.

Resolved Issues and Improvements

This firmware release has resolved the following issues and makes the following improvements to the previous 4.1 release.

- PTP** PTP phase adjustment (such as during holdover recovery) is significantly improved, without any large “overshoot”.

The boundaryHops value for transmitted Management messages (with the SMPTE Synchronization Metadata TLV per the ST 2059 profile) is no longer greater than the startingBoundaryHops value. This had caused some boundary clock switches to discard Management messages sent from the SPG9000.

The Delay Asymmetry value for a follower configuration is no longer constrained to integer microseconds. A floating-point value with 0.001 μ s (1 ns) resolution can now be used, to a limit of $\pm 99.999 \mu$ s.

A PTP leader will no longer remain in the Initializing state indefinitely if the reference source is GNSS and the constellation selection is BeiDou Only or Galileo Only.

The PTP status on the web interface will no longer show incorrect Mode, Time or Domain values when the instance is in the Initializing state.

- IP** Standard definition (720×576 and 720×486) formats are now correctly generated for ST 2110-20 video streams. The 486-line format is generated as 486 lines of active video and 1 line of black, so the SDP now correctly shows height=487.

Interlaced video formats no longer have RTP sequence number errors.

The 12-bit 4:4:4 video formats no longer have some pixel placement errors on certain video lines.

The 12-bit 4:4:4 video formats now have the color component channels in the correct sample order in the ST 2110-20 stream.

Switching between video formats (frame rates, sampling structures) no longer requires the stream to be disabled/enabled or change of packing mode before the new format is correctly generated.

If a video source (1-4) is configured for Level B 3G-SDI, that source is no longer available for use with an IP video stream. Use Level A 3G-SDI or use source 5-6 for the IP stream.

- SDI** Sample values are now correct for full range signals with individual video components (Y, R, G or B) disabled.

- Test Signals** Motion patterns (such as SMPTE RP 219 with Moving Box or EBU 3305 Color Bars with Motion) are now correctly rendered for interlaced formats.

Edge filter controls are now disabled when an image file is selected for the test signal.

Resolved Issues and Improvements

Genlock If the expected Genlock Input format is set to CW 10 MHz, but the actual input signal is a different format (such as NTSC, PAL or HD Tri-level), the reported status is no longer incorrect.

The fine horizontal delay control on the web interface correctly makes adjustments in nanosecond units, with limits of ± 10 ns for NTSC and PAL signals and ± 7 ns for HD Tri-Level signals.

Black One line of VITC is always enabled so that when a Source is selected, the time code is actually enabled.

LTC When the time-of-day source is set to PTP Follower, LTC outputs will have the correct time shortly after the PTP follower is locked to its leader.

The LTC timing adjustment from the front panel DELAY submenu now correctly sets the value in milliseconds with 10 μ s resolution.

System The File Manager now has controls to sort the file table. Click on the Name, Date or Size column heading to sort in ascending or descending order, as indicated by a triangle icon direction.

If a preset file is saved from the web interface, the yellow “Save in progress” message will no longer disappear before the save operation has actually completed.

Presets will correctly load when text using other characters sets (such as Chinese or Japanese) are present in the text ID overlay string.

The web session will now correctly time out in one hour after the last interaction with the browser, not one hour after the initial login.

The Phase-Locked Loops diagnostic values in the detailed System status are now correctly shown. These values may display “Unlocked” in red text for a few moments when switching between reference sources; this is normal behavior.

General Limitations

This firmware release has the following general limitations.

GNSS When using the Secondary Reference, first obtain a valid lock with the GNSS primary reference before switching to a CW 10 MHz or PTP follower secondary reference.

If the secondary reference is set to CW 10 MHz and the input signal is not stable, the system may take a long time to return to the primary reference source.

GNSS does not lock while system is in mobile mode and moving.

The web interface reports that GNSS is locked 10-15 seconds too soon when in Jam Phase holdover recovery mode.

General Limitations

If the GNSS signal quality is low, especially if multipath is present, then the UTC offset may shift and not recover for 12.5 minutes. This was more prevalent in the 1.0.1 release and can be detected by monitoring the syslog output. Software changes in the 2.0 release reduce the probability of this happening. To avoid this, first ensure the GNSS signal is strong. Secondly, configure the SPG9000 to defer leap second changes to a local time at least one hour after UTC midnight.

PTP Do not configure the reference source as PTP Follower such that the follower port can track a leader on the other port of the same SPG9000. A PTP port may follow a leader on the other port, but not if the reference source is PTP Follower as that would create a “loop” to itself. You also cannot configure both ports to Ordinary Clock mode on the same network and same domain because one OC in follower state could lock to the other OC in the leader state. These are unstable configurations.

When using Dynamic Priority with multiple SPG9000s that are powered-on at the same time, the preferred GM (as determined by the configured Priority 1 and Priority 2 values) may not start as the active leader, although GM changes are minimized on system startup. Use the Restore function if you wish to reset the active leader to the preferred GM.

SDI SDI timing adjustment is scaled wrong for some formats, so the amount requested is not equal to the actual offset of the signal.

6G-SDI outputs with 1080-line image size, frame rates of 47.95, 48, 50, 59.94 or 60 fps, and sample structures other than 4:2:2 10-bit are not fully tested due to equipment limitations. These are provided on a best effort basis only. Pathological signals are not correct.

Test Signals When loading a TIFF image for UHD and 4K formats, ensure that the source file has an image width and height that is divisible by 4 pixels, such as 3840 or 3836 but not 3838.

If TIFF image files (especially UHD or 4K size) are set for the test pattern output on one or more video sources in the Power-On Default preset, the system boot time will be noticeably longer. We recommend using a standard test pattern for the Power-On Default preset and then load the image file after the system is running.

NMOS NMOS should be disabled and re-enabled if the system’s domain name is changed.

The SPG9000 may briefly stop sending IS-04 “health” messages to the registry after several weeks of continuous operation. If this happens, the NMOS process will restart and the SPG9000 will re-register its node, device and sender resources.

System USB memory devices may erroneously report being damaged after removal from the SPG9000 and mounting on another computer.

Front panel display updates may briefly change to an intermediate setting before displaying the correct setting.

General Limitations

The system may not function properly immediately after a firmware upgrade when a new PLD is loaded. Always power-cycle the system after performing a firmware upgrade.

If the system time is incorrect (perhaps because the Internal time source is intentionally set to another time), files uploaded with the File Manager will show that incorrect date and time instead of the creation time of the source file.