



Sentinel R8.1 Release Notes

Release Date: November 2017



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Release Overview

Sentinel R8.1 Release

This release offers software only feature enhancements on Sentinel. No new options are associated with these enhancements.

The software has added the following feature and change to Sentinel:

- Powering off Sentinel has been simplified by using a single pop-up to control all power-down options.

The following known issues have also been resolved:

- SyncE wander generation amplitude and frequency accuracy has been improved for frequencies above 1Hz.
- In monitor mode the correction field was incorrectly used in calculating forward and reverse PDV measurements. The correct formulae are now implemented.
- The PTP statistics csv file had all fields set to 0. The statistics are now saved correctly
- False battery fault indications have been resolved.
- The 1PPS icon turns red during measurement incorrectly indicating loss of External 1PPS input

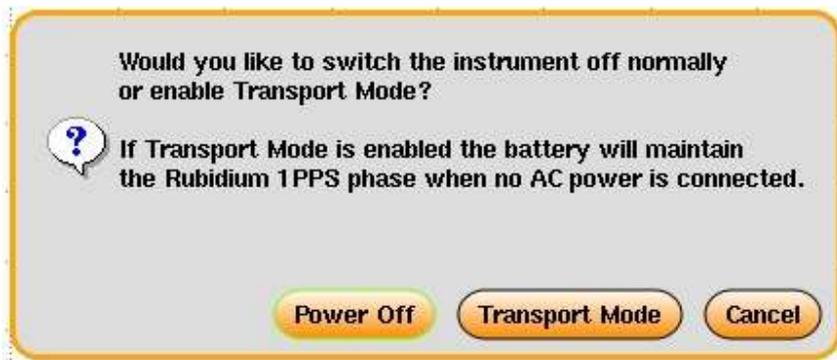
Features Description

Powering Off Sentinel Has Been Simplified

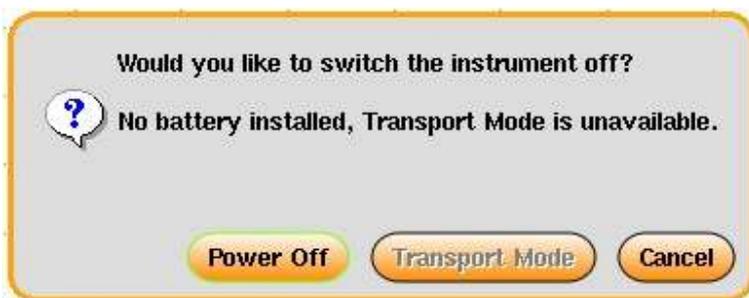
Sentinel can be fitted with a battery option that allows the internal Rubidium oscillator to remain powered while Sentinel is powered down, maintaining the 1PPS phase information. Previous versions of firmware presented a pop-up to confirm that Sentinel should be powered down, followed by a second pop-up asking if the battery should be used (Transport Mode).

These pop-ups have been replaced by a single pop-up with all options displayed.

If the battery is present the following pop-up is displayed:



If the battery is not present the following pop-up is displayed:



Improved SyncE Wander Generation Accuracy

Sentinel can generate SyncE wander with a frequency range of 100mHz to 10Hz and an amplitude range of 10ns to 10us. At frequencies above 1Hz the amplitude and frequency were greater than the target +/-5% tolerance. The method of generating SyncE wander has been changed and wander now remains within the target limits across all values of frequency and amplitude.

In Monitor Mode The Correction Field Was Incorrectly Used

If Sentinel is used in monitor mode and the Delay Request message contained a non-zero correction field value then this value was added to the value of the correction field in the Delay Response message and used in the calculation of reverse PDV. The correct operation is to subtract the correction field in the Delay Request message from the value in the Delay Response message.

In monitor mode Sentinel timestamps the packet arrival time as it appears on the TAP and is only concerned with any correction added in the path from the TAP to the grandmaster. Correction field values in the Delay Request message occur before Sentinel timestamps the packet arriving at the TAP and should be subtracted from the reverse PDV calculation.

In the forward direction the correction field in the Sync message was used twice in the calculation, doubling the effect of the correction field in the forward PDV calculation.

Note: These only affect calculations made in monitor mode where the Sync and Delay Request correction fields are non-zero.

PTP Statistics csv File Had All Fields Set To 0

R8 added the ability to track PTP packet statistics on screen and saved the values to a csv file at the completion of the measurement. Due to a firmware issue the file had all fields set to 0. This has now been resolved and the file contains the correct values.

False Battery Fault Indications

R8 introduced a new battery charging algorithm that allowed the health of the battery to be checked and a battery fault indicated by the battery icon and in the user log. There were two conditions that incorrectly caused the battery fault icon to be displayed:

- If Sentinel was powered on and the battery required charging while the Rubidium Oscillator was warming then a fault would be incorrectly indicated and an entry added to the user log. Normal operation would be to wait until the Rubidium oscillator had completed warming and then initiate charging.
- If Sentinel was being charged outside of the temperature limits for charging then a hardware interlock would prevent charging until the temperature returned within the limits. The firmware displayed the battery fault indication while this was condition persisted. This condition is normally encountered after leaving Sentinel in Transport Mode inside a carry case and should not display a fault indication

Either of these conditions will now display the battery charge percentage and indicate that charging is not taking place.

1PPS Icon Turns Red During Measurement

When the External 1PPS input is selected as the disciplining source, the 1PPS icon displays the presence of a valid 1PPS signal by turning the icon green if a signal is present or red when the signal is absent. If the disciplining mode is set to “Not during a measurement” the icon would turn red even if a valid signal is present. This was due to the Rubidium oscillator entering the manual holdover state for the measurement duration, preventing the state of the input 1PPS being detected.

As it is not possible to detect the presence of the External 1PPS input while the Rubidium is in manual holdover, the 1PPS icon will be clear in this state, returning to red or green when the Rubidium is removed from the manual holdover state.

Known Potential Issues

The following items are being investigated by Calnex and product updates will be provided as and when resolved:

1. Saving measurement data to USB memory may encounter issues with some memory stick types. If this issue is seen, we recommend using a different brand of memory stick or use the internal memory.
2. The Measurement Duration setting can incorporate processing times of ± 1 second for TIE and ± 10 s for PDV measurements
3. Loss of Signal: Short link down events may not be reported in the log if they happen between status requests to the PTP board