



# Sentinel R8 Release Notes

Release Date: May 2017



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# Release Overview

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## Sentinel R8 Release

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

The software has added the following features and changes to Sentinel:

- Ease of setup
  - ITU-T and IEEE1588 standard profile settings for PTP configuration
- Enhanced debug of PTP Setup
  - Protocol check to detect configuration issues
  - Packet capture and decode to resolve configuration issues
  - PTP statistics to check continuity of flows
  - Additional information in channel widgets
- Display Quality Level of ESMC messages for SyncE
- Improved Rubidium disciplining times
- Ability to view measurement summary file on GUI at end of measurement
- Changes to Battery Charging Algorithm

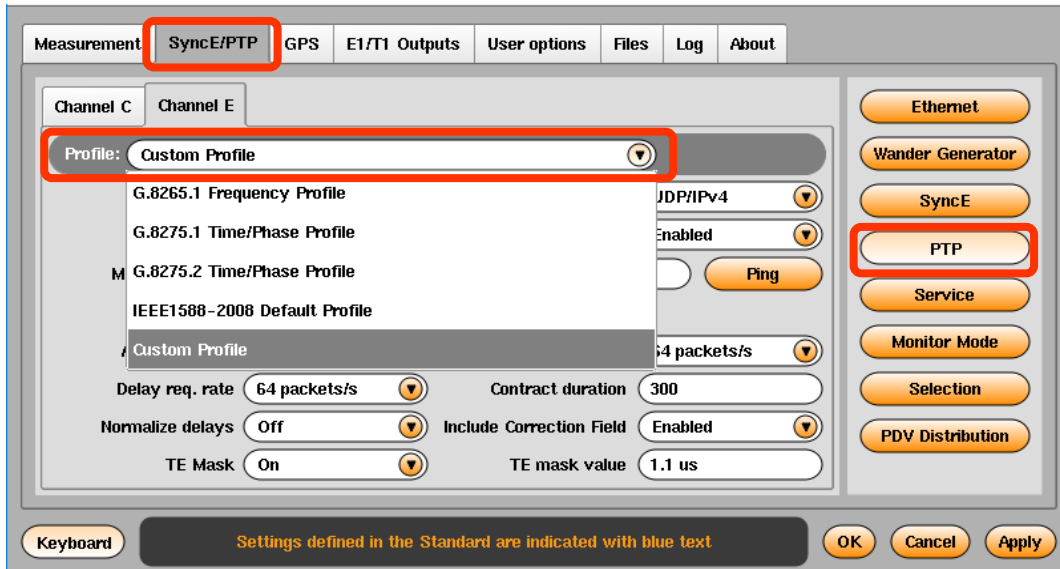
The following known issues have also been resolved:

- In Pseudo-slave mode, setting 128 packets/second rate on Sentinel will actually run at a lower rate (i.e. 105 packets/second)
  - 128 packets/second can now be transmitted
- Lock button: The lock button will not unlock when the measurement complete pop up box is displayed. A possible workaround for this is to VNC to Sentinel and press Ok to clear this pop up box, then the lock button will unlock.
  - Pop up box can be acknowledged then Sentinel lock button used
- An issue has been observed when entering certain values in the Antenna Delay field of the GPS settings. Some values will have no effect on the measurement result. If this is the case then setting the antenna delay 1ns above the desired value will work as expected.
  - Root cause identified and all values now work
- Remote access password could not be set in R7.x
  - Root cause identified and can now be set

# Features Description

## Profiles for PTP configuration

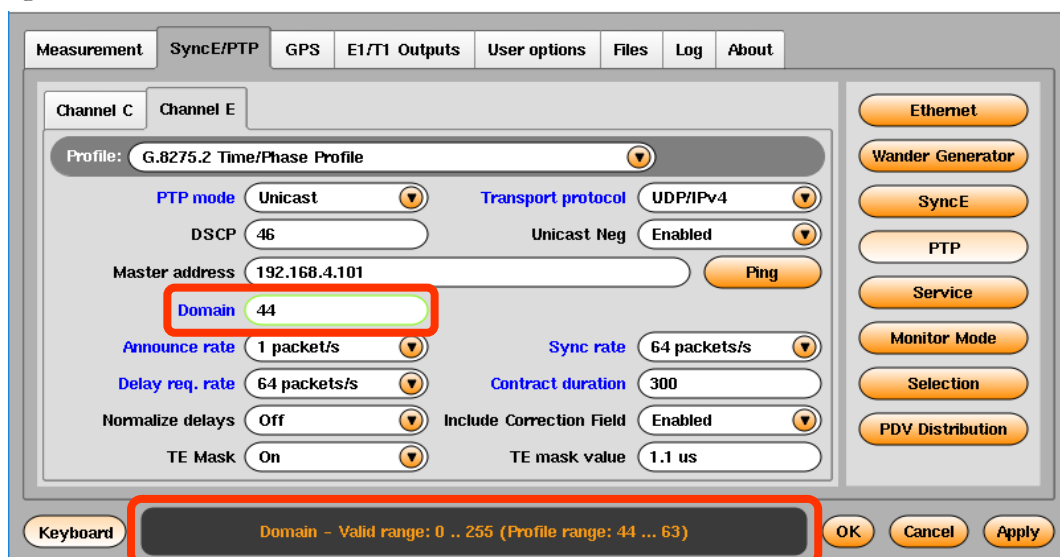
The SyncE/PTP -> PTP settings page format has changed.



Profile dropdown menu allows selection of standard profiles:

- ITU-T G8265.1 Frequency Profile
- ITU-T G8275.1 Time / Phase Profile
- ITU-T G8275.2 Time / Phase Profile
- IEEE1588-2008 Default Profile

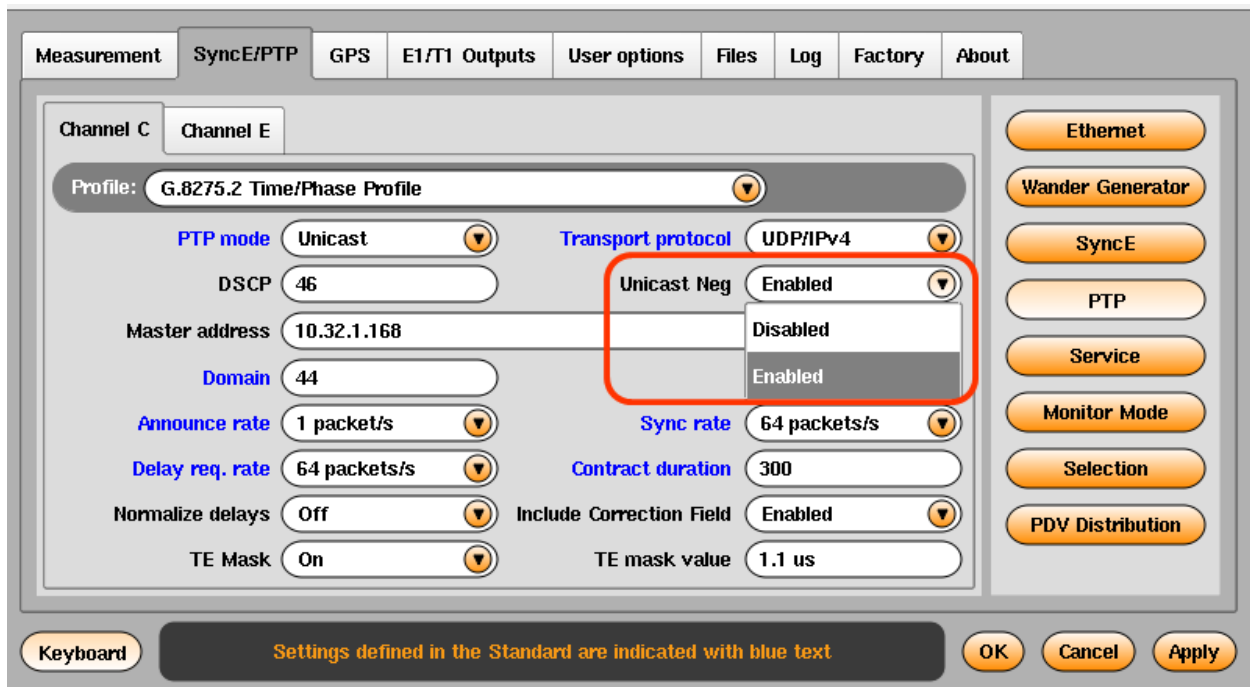
Once a profile has been selected the relevant fields are displayed and populated with default values. Standard fields for the selected profile are highlighted in blue text. Selecting any field displays the valid ranges for the field.



Certain fields still need to be configured by the user e.g. Master address. Ethernet and SyncE settings should be setup as required.

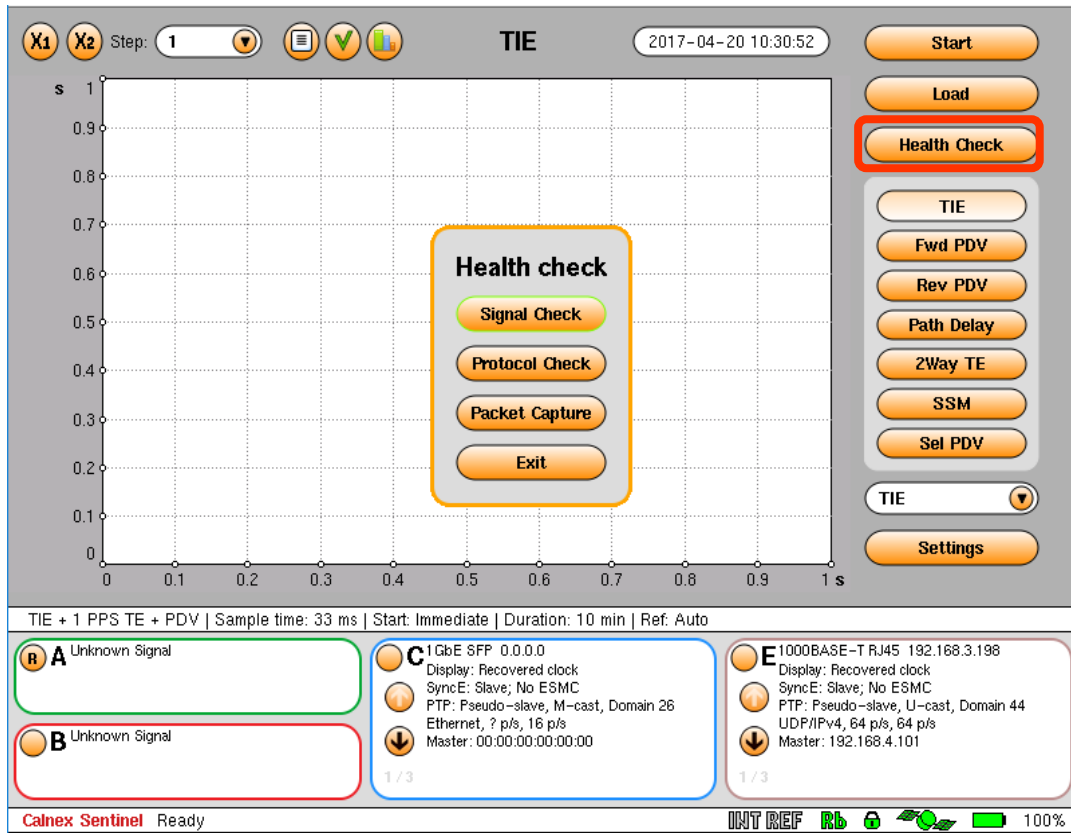
Any profile can be changed to any value, however, changing values in a standard profile that is outside the range for the profile will cause the profile to change to **Custom Profile**.

New fields have also been added to allow the user to enable / disable Unicast negotiation along with the ability to set the TTL field for UDP/IPv4 Multicast (Hop limit for UDP/IPv6).



## Health Check

On the main GUI, the Health Check button allows access to new features that aid the user to ensure the measurement is setup correctly.



**Signal Check** – functionality has not changed. This is required to setup measurement channels and SyncE TIE measurements. The PTP channel link status is also displayed.

**Protocol Check** – this can be used to verify T-GMC and Sentinel settings are complementary. Protocol check runs until all PTP flows have been validated. As protocol check is running the table is updated as each PTP message is detected. The rate specified in the PTP header is measured. The final display will show missing PTP message flows, PTP message flows that do not conform to their advertised rate and incorrect settings e.g. Master Domain number.

The screenshot displays the TIE software interface. At the top, it shows 'TIE' and the date '2017-04-20 12:15:14'. A 'Protocol Check' dialog box is open, comparing settings for two nodes: C (G.8275.1) and E (G.8275.2). The dialog includes a table with the following data:

	C (G.8275.1)	E (G.8275.2)
Signalling	N/A	✓
Announce Rate	✓	✓
Sync Rate	✓	✓
Follow-up Present	N/A	N/A
Del-Request Rate	✓	✓
Del-Response Present	✓	✓
Master Address	01:1b:19:00:00:00	192.168.4.101
Slave Address	04:00:00:00:00:0a	192.168.4.198
Mode	Multicast	Unicast
Master Domain	24	44

Below the table, there are 'OK' and 'Abort' buttons. The background of the software shows a graph with a y-axis labeled 's' ranging from 0 to 1 and an x-axis from 0 to 0.2. On the right side, there is a sidebar with buttons for 'Start', 'Load', 'Health Check', 'TIE', 'Fwd PDV', 'Rev PDV', 'Path Delay', '2Way TE', 'SSM', 'Sel PDV', and 'Settings'. At the bottom, there are three status boxes for nodes A, B, C, and E, and a system tray with 'Calnex Sentinel Ready' and a 100% battery indicator.

**Packet Capture** –Packet Capture can be used to further analyse issues with connection to the T-GMC. Packet Capture can be performed selectively on single or multiple PTP cards with filtering of the packets captured by PTP-type. When the capture is complete configurable filters can be used to examine a particular sub-set of packets. Packet headers can be displayed decoded at the transport level, at the PTP level or as raw data.

Captured packets can be saved in pcapng and pcap format for viewing offline in 3<sup>rd</sup> party analysis tools e.g. WireShark or using the Calnex PTP Field Verifier.

The full functionality of Packet Capture is detailed in the Reference Guide.

**Packet Capture**

Capture Slot A  
  Capture Slot C  
  Capture Slot E  
 Local Time

Sync  
  Follow-up  
  Del-Req  
  Del-Resp  
  Signalling  
  Announce  
  All Ethernet

Single Packet of Type(s)  
  Capture Number of Packets   
 Received Slot A:  Slot C:  Slot E:

Slot	Type	PTP Type	Vlan	Source	Destination
36	E	PTP-UDP	----	192.168.4.198	192.168.4.101
37	E	PTP-UDP	----	192.168.4.101	192.168.4.198
38	E	PTP-UDP	----	192.168.4.101	192.168.4.198
39	E	PTP-UDP	----	192.168.4.101	192.168.4.198
40	E	PTP-UDP	----	192.168.4.198	192.168.4.101

Showing 050 of 050

**Base** UTC Current Offset  Priority 1  Priority 2

**PTP** Steps Removed  Offset Scaled Log Variance  Clock Identity

**Announce** Time Source

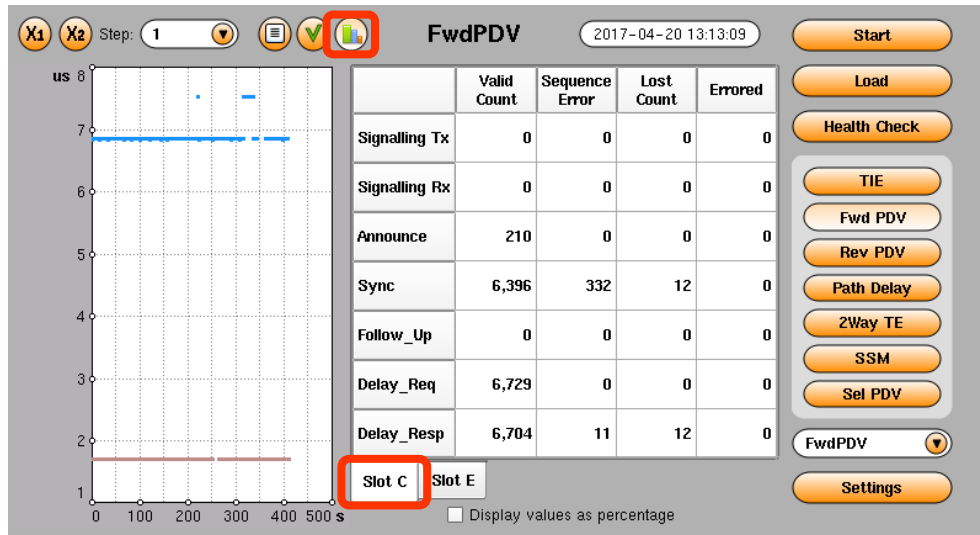
Clock Accuracy

**Raw** Clock Class



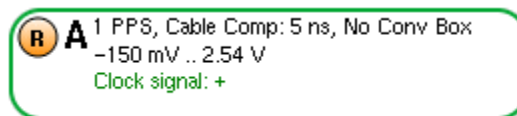
## PTP Statistics

Statistics for the PTP flows are available on the main screen. There is a tab for each PTP channel and there is also the option to display the values as a percentage.

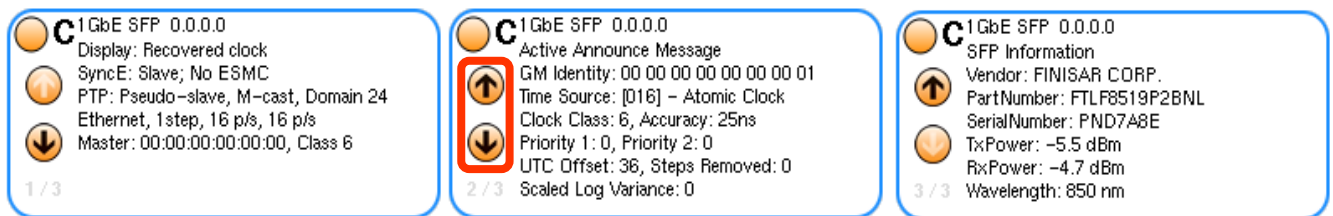


## Channel Widgets

Cable compensation was added to Sentinel in R7.2. The channel widget will now display cable compensation values for 1PPS signals if a 1PPS TE measurement is configured.

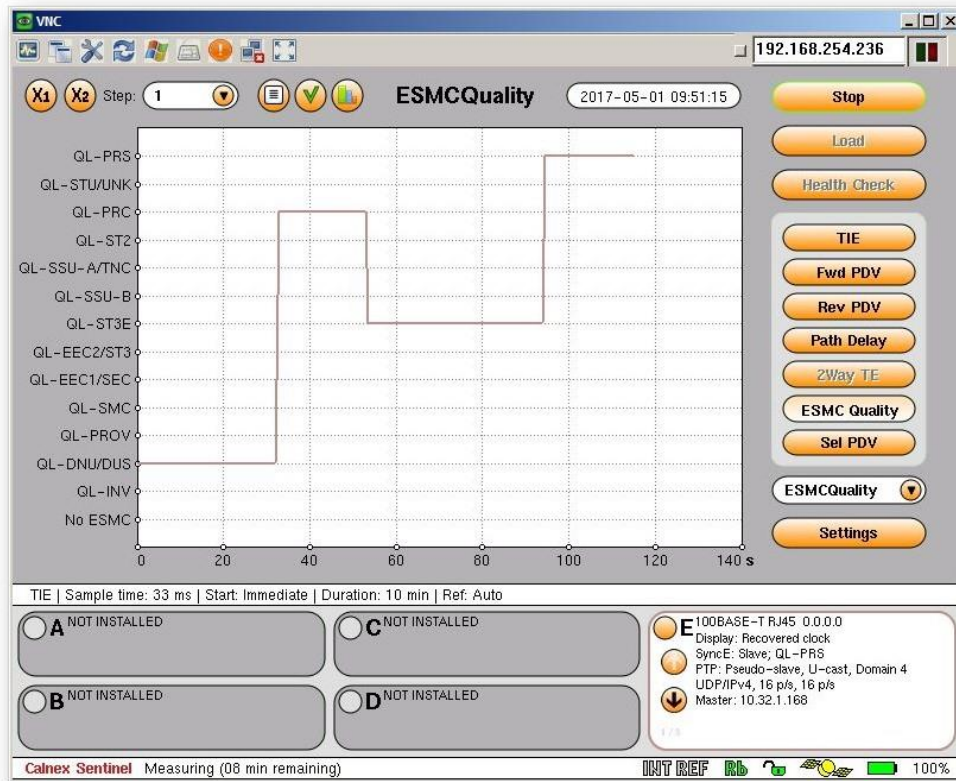


The PTP channel widgets now also have an additional page showing the last received PTP announce message contents. Arrows have also been added to navigate between the pages.



## Display ESMC QL

Sentinel can now display a graph of the SyncE ESMC Quality. This can be accessed from the main GUI and will show any clock transitions during the measurement.



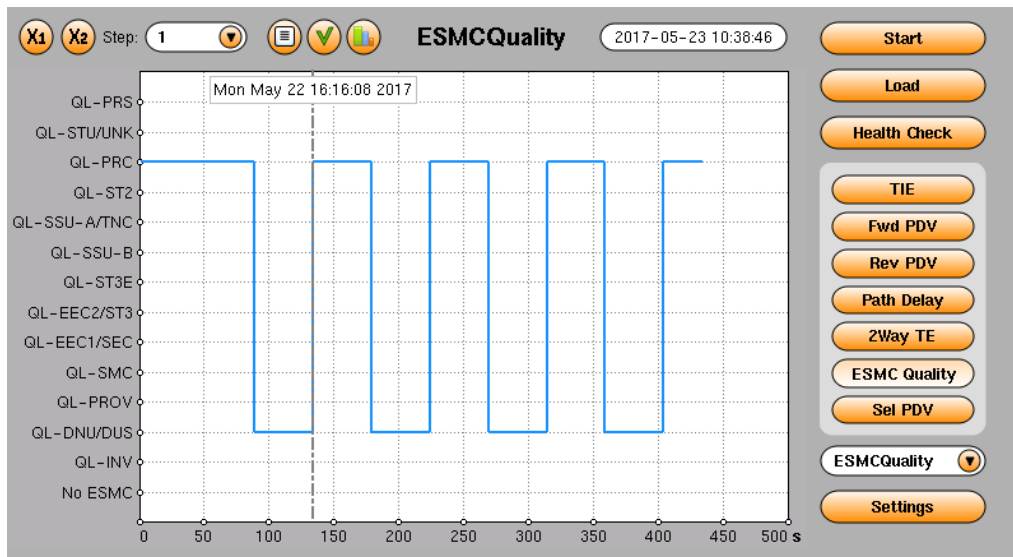
## Rubidium Disciplining Improvement

The disciplining times in Sentinel have now been reduced. If disciplining Sentinel using GPS or an external 1PPS of GPS quality then if disconnection was less than 1 week ago, you can now discipline for 6 hrs (previously 12 hrs). If longer than 1 week then we recommend 12 hrs (previously 24 hrs) disciplining prior to use.

An option has also been added to allow the user to discipline using a Caesium quality 1PPS signal. This will discipline the Rubidium in 1 hour.

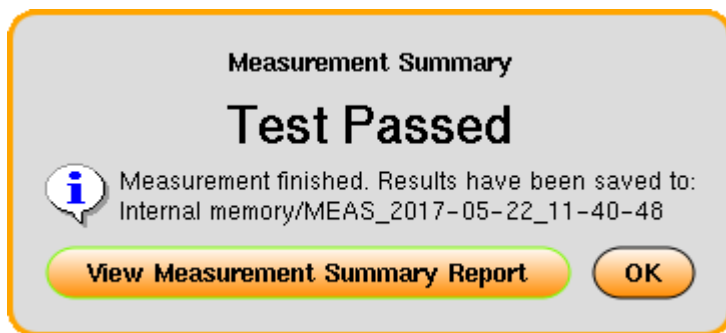
## Real Time Display On Measurement Graphs

Tapping on a point in a measurement graph will bring up a marker displaying the real time at that point. This can be used to correlate events on screen with external events.



## View summary after measurement complete






















Once a measurement has been completed, there is now an option to view the Measurement Summary Report on the Sentinel screen.




## Guide for Status Icons

A guide to the status icons that appear along the bottom of the Sentinel GUI can now be accessed on the screen. This can be accessed by tapping on the status icon bar.

### Status Icons

<p><b>Lock status:</b></p> <p> Screen lock is active</p> <p><b>Rubidium status:</b></p> <p> Rubidium is ready</p> <p> Rubidium is warming up</p> <p> Rubidium is not ready or Rubidium malfunction detected</p> <p><b>Rubidium disciplining status:</b></p> <p> Rubidium is disciplining and locked with a phase offset less than +/- 100ns</p> <p> Rubidium is disciplining and locked with a phase offset greater than +/- 100ns</p> <p> Disciplining is off. Either disciplining mode is set to 'Never' or disciplining mode is set to 'Not during measurement' and measurement is currently in progress or GPS is the disciplining source and GPS is not locked to at least three satellites.</p> <p> Disciplining is turned on, but not active yet (Rubidium is gathering PPS statistics)</p> <p> Disciplining is turned on, but no valid disciplining signal is present</p>	<p><b>Timebase Reference status:</b></p> <p> External signal is used as Timebase Reference</p> <p> Internal Rubidium is used as Timebase Reference</p> <p><b>GPS / 1PPS status:</b></p> <p> GPS is locked to at least 3 satellites and site survey is complete</p> <p> GPS not locked yet, but some satellites visible</p> <p> No antenna or no visible satellites</p> <p> GPS malfunction</p> <p> 1PPS on external 1PPS input detected</p> <p> 1PPS on external 1PPS input not detected</p> <p><b>Battery status:</b></p> <p> Battery is installed and not charging. Battery will not charge when 100% charged or while Rubidium is warming up or if the battery temperature is less than 0°C or greater than 45°C. (charge % is indicated next to battery icon)</p> <p> Battery is installed and charging (charge % is indicated next to battery icon)</p> <p> Battery is not installed</p> <p> Battery is installed but either an error has occurred reading battery controller or a battery fault has been detected</p>
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## Changes to Battery Charging Algorithm

The battery option in Sentinel is used to power the Rubidium oscillator and maintain phase information while being transported to a measurement site. The battery charging algorithm has been modified to prolong battery life. This change is mostly transparent to the user with transport mode duration unchanged and guaranteed for 3 hours. The battery status icon will indicate when charging is taking place and the fault icon will also be displayed if a battery failure occurs.

**Note:** Sentinel no longer charges when powered down with the AC power cord connected. Sentinel must be running for charging to take place.

## Known Potential Issues

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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  $\pm 1$  second for TIE and  $\pm 10$ 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
4. Wander generation is inaccurate for frequencies above 1Hz. Wander generation will still be applied and visible but both amplitude and frequency will be out-with the selected values.