

## CAT v23.11

**NEW FUNCTIONALITY AND ENHANCEMENTS**

**(May 2019)**



**CAT**

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## 1 Software Release Overview

v23.11 (23.11.XX) adds the following features to CAT, for customers with a valid CSS (Customer Support Service) contract:

Paragon-neo enhancements	Sentinel enhancements	Base product enhancements
ITU-T G.8273.2 Max $ TE _L$ measurement, Class D limits  ITU-T G.8262.1 masks and limits	Over-the-air phase measurement	Defect Fixes

 To check the current software version installed, select **Help > About** on the CAT GUI.

## 2 Features and Benefits

Product Enhancement	Benefit
<b>Sentinel:</b> Over-the-air measurement	Use together with Sentinel Over-the-air measurement feature to determine in-service phase performance of Macro Basestations and Small Cells via radio interface, avoiding the need for physical connection at cell-sites.
<b>Paragon-neo:</b> ITU-T G.8273.2 Max $ TE _L$ measurement, Class C/D limits	Perform Boundary Clock and Ordinary Clock testing to standards for high accuracy applications such as 5G x-haul.
<b>Paragon-neo:</b> ITU-T G.8262.1 Masks	Validate SyncE performance of Enhanced EECs to high accuracy as per ITU-T G.8262.1

### 3 Sentinel Features

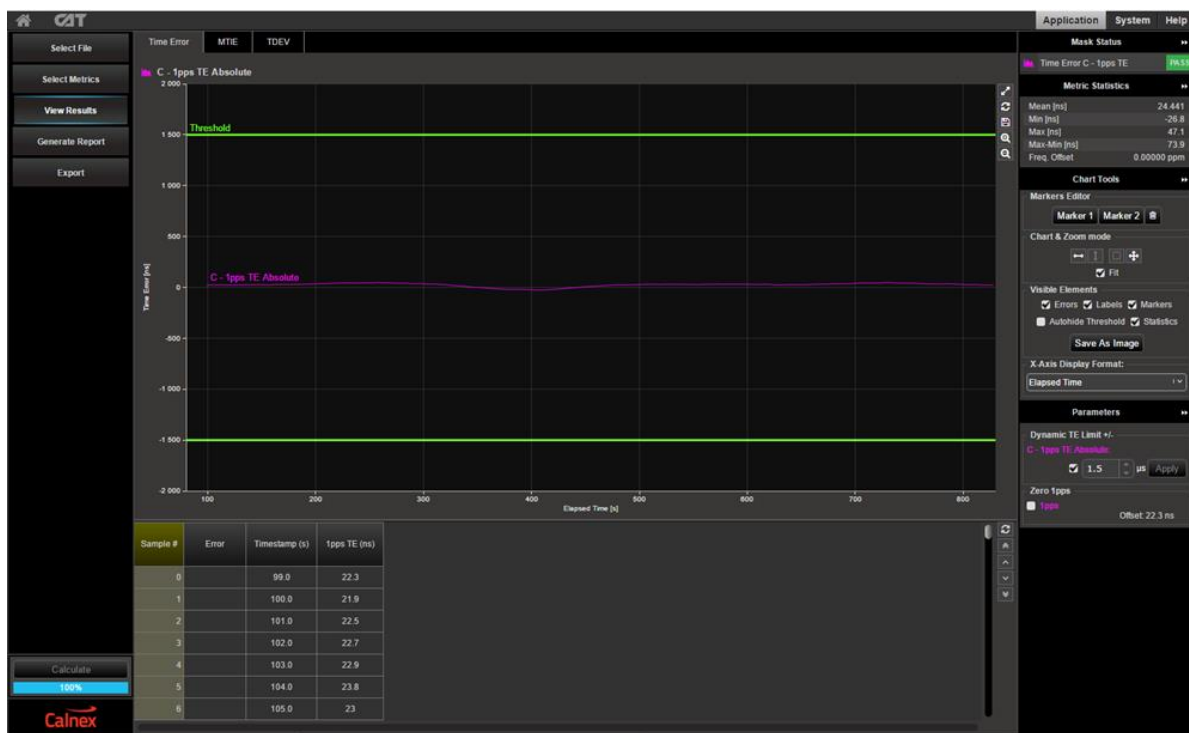
#### 3.1 Over-the-air Phase measurement

Sentinel units with the Over-the-air measurement (OTA) module can determine the absolute timing accuracy of an LTE ENodeB relative to a 1pps signal by analysing the timing signals within the LTE Radio-Frequency (RF) frame structure, enabling field test of true basestation timing performance on the air interface.

This release of CAT can be used to examine the OTA results in more detail.

Extract the measurement files of interest from the Sentinel and transfer them to a PC where the CAT is available. On opening these files within CAT you will be able to select the OTA metric and view the results.

The frequency offset is also shown in the metric statistics on the right hand panel.



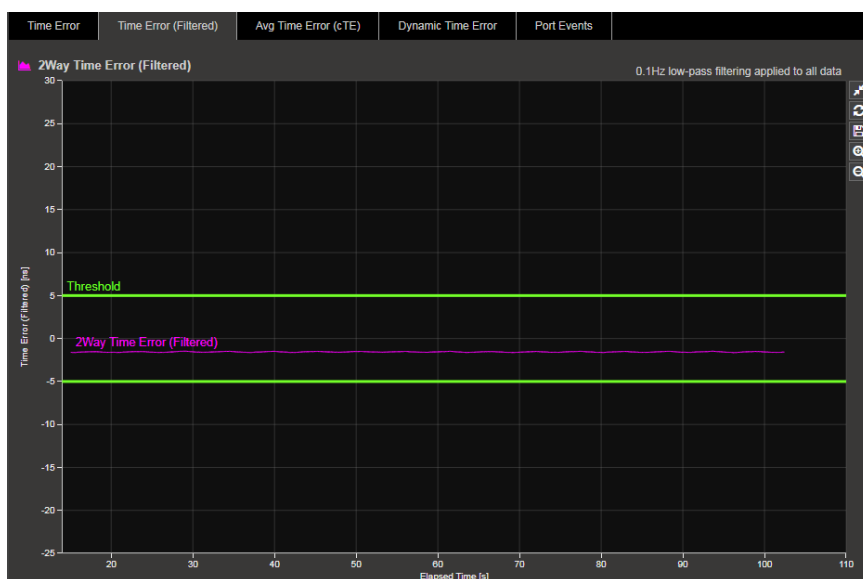
## 4 Paragon-neo Features

### 4.1 ITU-T G.8273.2 Max $|TE|_L$ measurement, Class C/D limits

To allow suitable testing for 5G-level device timing performance, with very low Time Error performance thresholds, the ITU-T developed the **Maximum Time Error Low-Pass filtered** (Max  $|TE|_L$ ) metric. This is essential for validating Class-D devices.

In this release, captures made with the sub-ns accuracy Paragon-neo equipment can be analysed (real-time on Neo, or offline) using this metric, selectable from the metrics page in CAT.

The results can be viewed in the **Time Error (Filtered)** tab. The default limit for this metric is +/- 5ns which is the Class-D limit defined in ITU-T G.8273.2 (applied to 2way TE), but can be adjusted by the user as required for their application.



### 4.2 ITU-T G.8262.1 Masks for Enhanced Clocks

To allow full ITU-T standards-based SyncE testing for enhanced clocks, the Calnex Analysis Tool has been updated to include all recently ratified limits and masks for G.8262.1, e.g. Short-term phase transient. These can all be selected as needed in the drop-down menus in TIE, MTIE or TDEV tabs.



## 5 Appendix A: Software Advisory Notes

- In standalone operation and via Calnex product GUI, this release is fully supported on Windows 10.
- When using automation, it is recommended to have live captures stopped before trying to access/read data via script, as there can be intermittent errors.

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