

Calnex Paragon - *x*



Software Release 27X (X.10.40.xx) November 2018

NEW FUNCTIONALITY AND ENHANCEMENTS




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1 Software Release Overview

Release 27X (X.10.40) adds the following features to Paragon-X, and PFV¹

SUS (Software Upgrade Service)



Enhancements to existing options	Base product enhancements
<p>SyncE Wander and ESMC (Option 213):</p> <ul style="list-style-type: none">Wander Transfer enhancements: Settling Time, Calibration Bypass, Enhanced test points <p>Enhanced Noise Transfer Tool (ENT) [Requires Opt. 250 or 270]:</p> <ul style="list-style-type: none">Updated ITU-T G.8273.2 transfer test limits <p>Peer-to-Peer Master Slave Emulation (Option 252):</p> <ul style="list-style-type: none">IEEE 802.1AS-REV SupportIEEE/IEC 61850-9-3 Support <p>PTP Field Verifier (PFV):</p> <ul style="list-style-type: none">IEEE 802.1AS-REV Pass/Fail analysisIEEE/IEC 61850-9-3 Pass/Fail analysis	Defect Fixes

 To check the current software version installed, select Help > About Paragon Remote Client on the Paragon-X GUI.

¹ This release includes enhancements to the PFV. The PFV option allows PTP protocol to be analysed to standards-based and user-defined profiles.

2 Features and Benefits

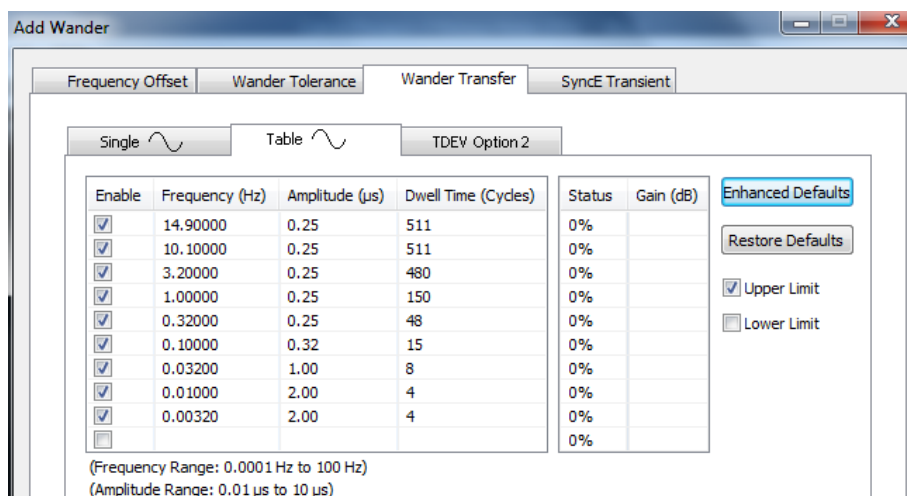
Paragon-X	Benefit
SyncE Wander and ESMC (Option 213): Wander Transfer enhancements	Faster test with more insight into device behavior – improved test points and settling times allow a clearer view of DUT performance, and the option to reliable bypass calibration based on known tester performance greatly reduces total test time.
Enhanced Noise Transfer Tool (ENT) [Requires Opt. 250 or 270]: Updated ITU-T G.8273.2 transfer test limits	Ensure that standards-based testing reflects the latest guidance from the ITU-T.
Peer-to-Peer Master Slave Emulation (Option 252): IEEE 802.1AS-REV Support	Perform complete Time Error testing on devices intended for use in Industrial networking environments, using the latest version of the IEEE general PTP (gPTP) profile; 802.1AS-REV
Peer-to-Peer Master Slave Emulation (Option 252): IEEE/IEC 61850-9-3 Support	Perform complete Time Error testing on devices intended for use in Power generation and distribution environments, using the latest version of the IEEE/IEC PTP Utility Profile; 61850-9-3
PFV	Benefit
IEEE 802.1AS-REV 'gPTP Profile', IEC/IEEE 61850-9-3 'Utility Profile'	Allows fast protocol analysis (and debug) for gPTP and the Utility Profile, for devices using these - or multiple - profile configurations

3 Enhancements to Existing Options

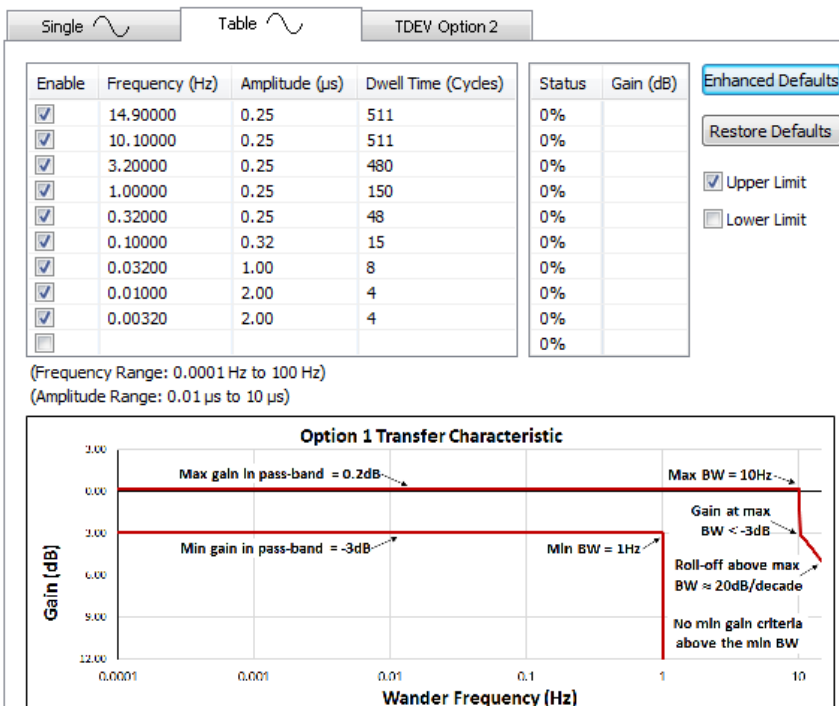
3.1 G.8262 SyncE Wander Transfer Enhancements (requires Option 213: SyncE Wander & ESMC)

When performing SyncE Wander Transfer testing, as per ITU-T G.8262, it is advantageous to be able to remove any settling effects from a DUT as the stimulus moves from one frequency to another. To enable this, in this release the Paragon-X and Calnex Analysis Tool (CAT) automatically adjust the measurement period during the transfer test to avoid including the time erod during which the DUT could experience settling effects.

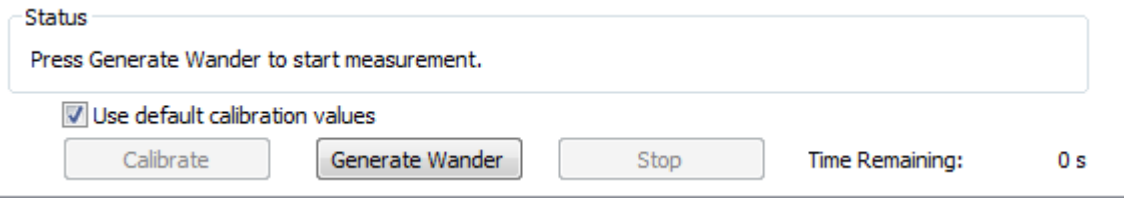
The range and values of the default test points can be modified to represent the current best practice as per the G.8262 recommendation, allowing deeper insight into device performance. To apply these values, select **Enhanced Defaults** in the **Wander Transfer->Table Sine** tab. The values can be reset to the standard values by selecting **Restore Defaults**



The choice of whether to apply Upper limits, lower limits, both or neither is now also available based on tick-box selection, allowing deeper analysis of EEC devices within the allowed pass-band:



In addition, to avoid users having to perform potentially very lengthy pre-test calibration, there is now an option to **use default calibration values**. Through extensive internal testing, Calnex are able to confirm that the Paragon-X meets all ITU-T O.174 and G.8262 requirements using these pre-established values. Use of default calibration values is achieved by selecting the tick-box at the bottom of the **Wander Transfer-> Table Sine** tab:



3.2 Updated ITU-T G.8273.2 transfer test limits (Using Enhanced Noise Transfer Tool [ENT], requires Opt. 250 or 270)

The ITU-T G.8273.2 noise transfer test limits have been updated to account for the noise floor of devices, including a minimum attenuation value of 20dB in the appropriate stopbands. The test criteria applied in the Enhanced Noise Transfer tool have been adjusted accordingly. The resultant filter characteristics for test are outlined in the images below for both PTP-to-PTP and SyncE-to-PTP filters. For more information about the ENT, please see the **Enhanced Noise Transfer Script Getting Started Guide** in the Enhanced Noise Transfer bundle, which is installed by default in the **Calnex->Paragon-X folder within Program Files**.

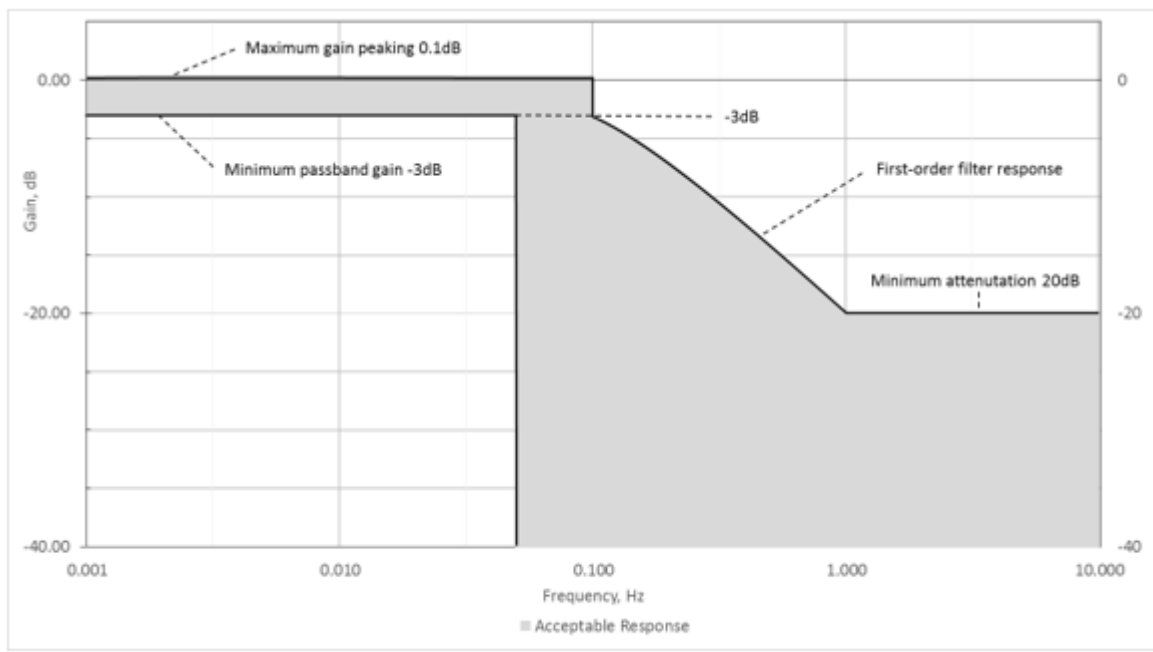


Figure VI.5: Frequency Response of Acceptable PTP to PTP Filter Implementation

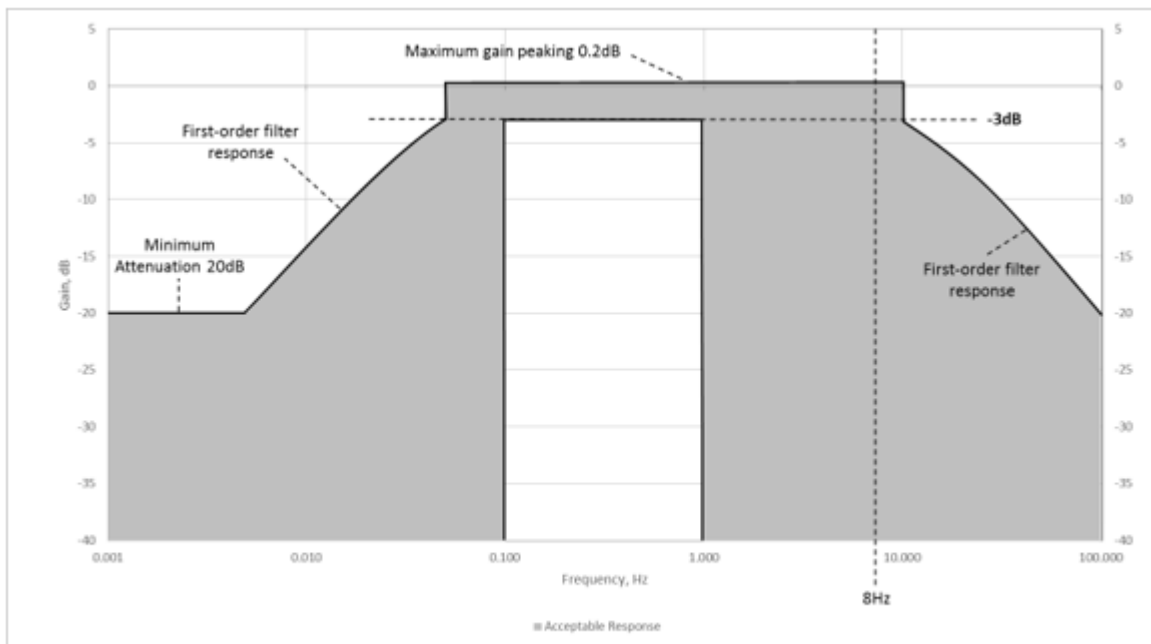


Figure VI.6: Frequency Response of Acceptable SyncE to PTP Filter Implementation

3.3 PTP Utility Profile support (requires Option 252: Peer-to-Peer Master Slave Emulation)

The IEC 'Utility' profile (IEC 61850-9-3) defines the fundamental settings and parameters for the use of PTP in a Power/Utility environment, and is a pre-requisite for applying other settings in line with IEEE C 37 238-2017 Power Profile. Robust definition of generated message parameters is essential in confirming compliance and interoperability.

The Utility Profile is now available as an 'auto-configure' drop-down option in the Master/Slave emulation configuration page. Users can also adjust parameters, and will be notified if they have moved outside of the acceptable ranges of values, as the Profile selection will move to 'Custom'.

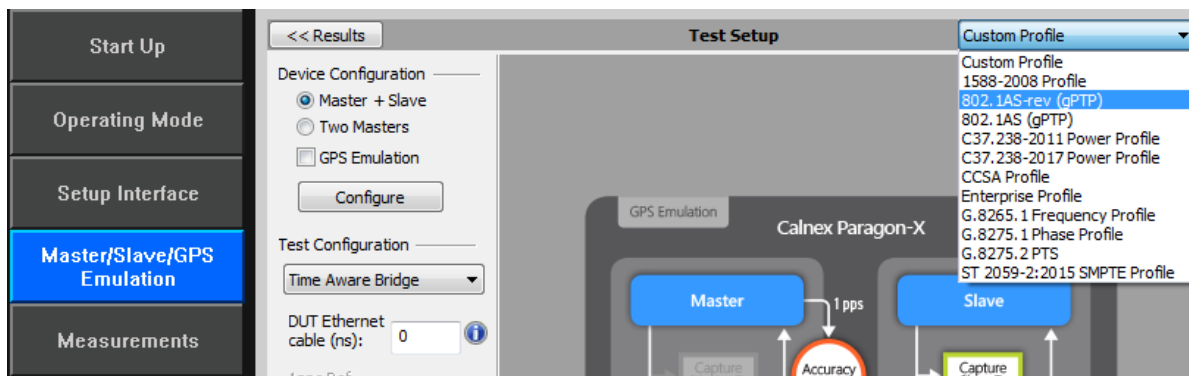


Note that the 2011 and 2017 Power Profile selections are also available, useful for testing interoperability and performance issues in devices and systems in the event of mismatching implementations being used.

3.4 IEEE 802.1AS-REV (gPTP) support (requires Option 252: Peer-to-Peer Master Slave Emulation)

The IEEE 'gPTP' profile has a revised version, 802.1AS-REV, which defines the fundamental settings and parameters for the use of PTP in network environments such as for industrial automation, and is a pre-requisite for applying other Time-Sensitive Networking capabilities, such as scheduled windows. Robust definition of generated message parameters is essential in confirming compliance and interoperability.

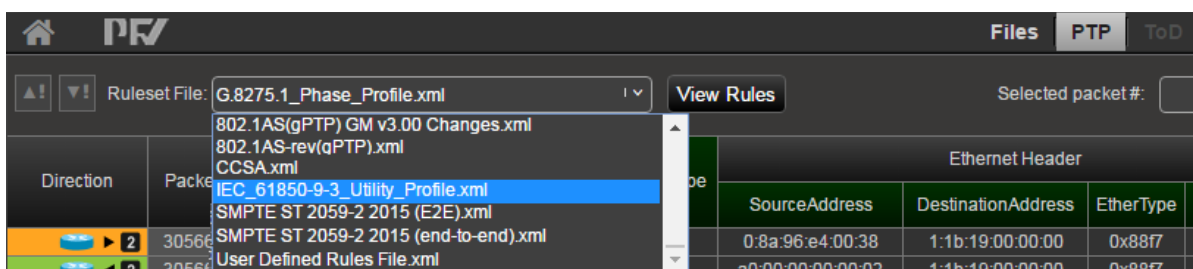
802.1AS-REV is now available as an 'auto-configure' drop-down option in the Master/Slave emulation configuration page. Users can also adjust parameters, and will be notified if they have moved outside of the acceptable ranges of values, as the Profile selection will move to 'Custom'.



Note that the previous 802.1AS selection is also available, useful for testing interoperability and performance issues in devices and systems in the event of mismatching implementations being used.

3.5 PFV: PTP Utility Profile support (requires Option 950: PFV)

As mentioned in the above section, this release enables support for the IEC/IEEE Utility Profile – this also applies to the message decode and Pass/Fail analysis capability of PFV:



3.6 PFV: 802.1AS-REV support (requires Option 950: PFV)

As mentioned in the above section, this release enables support for the IEEE 802.1AS-REV gPTP Profile – this also applies to the message decode and Pass/Fail analysis capability of PFV.

4 Appendix A: Software Advisory Notes

- This release has increased the minimum number of cycles of dwell time which can be set for generated SyncE wander using the table configuration tool, due to the enhancement allowing settling time between rows. The minimum dwell time depends on the chosen frequency, and it is possible that existing scripts could return an out of context error if setting values below the new minimum, which can be resolved by adjusting the number of cycles to a higher value as appropriate.
- The PFV and CAT tool version numbers have been modified to increment in parallel – as a result the PFV version with this release has a large increment to v22.
- When measuring time error at 100M, MSE should be started **before** the capture is started. If MSE and capture are started at the same time, then a time error offset of 40ns may occasionally be measured.

To start MSE separately from capture, in MSE, configure the filters required and press “Set”; **then** start MSE. After a few seconds, start the capture.

- Port 2 link must be up (Rx connection in place to port 1 Tx) in order to allow Port 2 Tx to function in Packet Generation mode.
- Script recorder does not support manual setting of filters through ‘flow filter’ in Through Mode operation. This can be addressed by saving filter settings and then recalling the saved settings in your script.

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