

Paragon-neo

Paragon-neo A (PAM4) Release 9

NEW FUNCTIONALITY AND ENHANCEMENTS

(Release 09.00.XX)





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1 Software Release Overview

Release 9 (09.00.XX) adds the following features to Paragon-neo.



♥ To check the current software version installed, select **Help > About** on the Paragon-neo GUI.

2 Features and Benefits

Paragon-neo A	Benefit			
Option NEO-A-100G (PAM4 Optical)	Quick and easy validation of PTP and/or SyncE			
	capabilities over 100G PAM4 using the QSFP28 interface.			
Option NEO-A-200G (PAM4 Optical)	Quick and easy validation of PTP and/or SyncE			
	capabilities over 200G PAM4 using the QSFP56 interface.			
Option NEO-A-RTE	The option now allows a third port (1Gb only) to provide			
	a PTP M-Clock to the DUT as well as the two S-Clocks			
	used for relative measurements.			
Option NEO-A-SMPTE	SMPTE Profile PTP testing. Allows SMPTE ST 2059-2 PTP			
	profile to be generated, in combination with the			
	functionality of any installed PTP M-Clock/S-Clock			
	emulation option. Must be ordered together with a PTP			
	option.			

3 New Options

3.1 Option: NEO-A-100G (PAM4 Optical)

This option allows validating the DUT to PTP and/or SyncE standards-based synchronization, including ITU-T G.8273.2 conformance testing of devices (DUTs) up to Class C specification using the QSFP28 interface.

This option uses the QSFP28 interface rather than the SFP-DD interface due to the greater availability of QSFP28 PAM optical modules. This option will be updated to include SFP-DD modules in a later release.

 Image: Start 1:00
 Topic

 Topic
 Output

 Topic
 Topic

 Topic
 Topic

In the Setup Ports page select the QSFP28 interface to enable 100G PAM4:

3.2 Option: NEO-A-200G (PAM4 Optical)

This option allows validating the DUT to PTP and/or SyncE standards-based synchronization, including ITU-T G.8273.2 conformance testing of devices (DUTs) up to Class C specification using the QSFP56 interface.

			1pps	ToD Reference		1								
			1pps Bal + ToD		1pps									
CI	lock Reference			Out	\bigcirc									
Input		Output												
Internal			Inte	mai		Test Ou	d and							
BNC	RJ48	BNC			(1pps Bai + ToD	BNG							
\bigcirc		\bigcirc		In	\bigcirc		\bigcirc							
	F	fort 1				Port 2	2	,		Port 1	P	ort 2	Freq Meas Bal	Freq Meas Unbal
2.5G/5G/10G	1G SFP	SFP28 SFP+	QSFP28 QSFP+		QSFP28 QSFP+	SFP28 SFP+	1G SFP		100M SFP	10081 1GbE	1GbE	100M SFP		
		_			Port 1					Port 2				
			SFP56	QSFP56		CFP2		CFP2		QSFP	56	SFP56	1pps Bal + ToD	1pps Unbal
			SFP-DD	QSFP-DD						QSFP-	DD	SFP-DD		
						i		L	i					
Referen	ices		Ethernet		Frequer	icy Measurements		Ipps / ToD Measurements	•	1	fest Out			
Port Coupling: On														
Port 1							Port 2							
Line Rate:							Line Ra	e: 200G						
Interface Type:	O QSFP56						Interfac	e Type: O QSFF						
	QSFP-DD							O QSFF						
RS-FEC							V RS-							
✓ Details							* (etails						

In the Setup Ports page select the QSFP56 interface to enable 200G PAM4:

3.3 Option: NEO-A-SMPTE

The Society of Motion Picture and Television Engineers (SMPTE) has defined the 2059-2 PTP profile to meet the needs of Professional Broadcast. Hence this is commonly referred to as the *PTP Broadcast Profile*.

Along with the requirement to configure equipment and networks appropriately to deliver synchronization accurate to 1 microsecond across a network, the Broadcast profile provisions for a **Synchronization Metadata (SM) TLV** – carried in PTP management messages – to carry timing-related information (such as default frame rates) through the Ethernet network.

With the addition of this profile option (SMPTE) to any installed PTP M-Clock/S-Clock emulation option (?), the ability to configure SMPTE ST-2059-2 PTP quickly using the drop-down profile tool, plus the generation of management messages with editable SM-TLV is added to the pre-existing PTP functionality.

Seneral VLAN Tags Messag	ing Unicast Header	Announce TLVs					
Announce Sync Follow	Up Signaling 1 Signaling 2	Signaling 3 Management					
7 Send to connected Multicast	S-Clocks at 1 Pkt	s M-Clock Configuration					
TLV 1 🔺	ORG_EXT_SYNCH_METADAT						
Туре	00:03	General VLAN Ta	igs Messaging	Unicast	Header	Announce	TLVs
Length	48	Announce Svr	c Eoliow-Uo	Signaling 1	Signaling 2	Signaling 3	Managemen
OrganizationId	68:97:E8					ongine ing c	
OrganizationSubType	00:00:01	Send to connected	Multicast	✓ S-C	locks at 1 Pkt/	s 🗸	
defaultSystemFrameRate	00:00:00:00:00:00:00:00	currentLocalOffset	-37				
masterLockingStatus	00	jumpSeconds					
timeAddressFlags	00	timeOfNextJump		0			
currentLocalOffset	-37	timeOfNextJam		0			
		timeOfPreviousJam		0			
		previousJamLocalOf	fset	0			
		davlightSaving		-			

4 Enhancements to Existing Options

4.1 Option: NEO-A-RTE

This release provides an update to the TE_R test mode that captures two PTP M-Clocks simultaneously. The option now allows a third port (1Gb only) to provide a PTP M-Clock to the DUT.

Port 2 (labeled 100M SFP however it is configured as 1Gb SFP) is automatically selected for this purpose.

	Por	Freq Me	
0BT	100BT	100M	
GbE	1GbE	SFP	
abled	Disabled	M-RTE	

The port is automatically configured to 1Gb.

References		Ethernet	Frequency Measurements	1pps / ToD Me	easurements	Test Out
Port Coupling: On						
Port 1				Port 2		
Line Rate:				Line Rate:		
Interface Type:	SFP28			Interface Type:	O SFP28	
	SFP+				SFP+	
RS-FEC				RS-FEC		
✓ Details				✓ Details		
			-	NOTE		
				MI-RIE		
				Line Rate:		
				Interface:		
				Auto Negotiate		

Select **Relative Time Error / 2 x TE** as before. Then configure the **M-Clock** as well as both **S-Clocks** by clicking on the appropriate icon.

Test Mode:	Polativa Tima Error / 2 x TE	
Test mode.	Relative time Endry 2 X TE	
PTP Profile:	G.8275.1 Phase Profile	~
Î	Config	
s	S-Clock 2 Test S-Clock 1 Config Config Config	ЪΙ
	D.U.T.	_
*		

The same measurement process for making relative time error measurements can then be followed.



Appendix A: Software Advisory Notes

- For more information on features and fixes in this Release, along with other user information on Calnex products, please visit the Knowledge Base at: https://calnexsolutions.atlassian.net/wiki/spaces/KB/overview
- There is a known issue in this release that removal and re-connection of 1PPS / TOD measurement cable during a test will result in TOD offset. To ensure expected performance, toggle the 1PPS between internal and external after pulling the cable to re-synchronise the sequence numbers.
- When using the additional M-Clock function while configured for relative time error measurements, it is not recommended to transfer jumbo packets to the M-Clock. In this particular scenario, the RTE master TE measurement performance is not guaranteed.
- Note that generating SyncE wander on the 100M elec/opt and the 1G elec may add pkt-pkt noise in the T1 and 2Way measurements. This noise does not affect the mean TE, in addition it is likely to be filtered out. This is for information only.

To Install:

The Paragon-neo software is delivered as a tar file (*.tar)

To install using tar file:

- Download the tar file and save it to a location on your PC.
- Before upgrading the instrument, you must first stop all generation and capture.
- Follow the steps below to upgrade:
 - 1. Click **System** in the menus on the top right of the UI.
 - 2. Click **Setup** in the left-hand menu bar. The UI should look something like below:

PARAGON-NEO			
Ontions	Software Update		
	To update the instrument software, plug a USB insta	ler stick into the ins	trument, or choose an installer tarball file to upload and install.
Setup	Choose installer file No files chosen		
Status	IP Control Port Configuration		
Message Log		Control port se	tings are accessed via the instrument's LCD panel. Instrument IP address can be obtained
File Management	. .	Automatic: IP Address: Host name:	Enubled 192.168.201.57
Factory			

3. Click **Choose installer file** to select the tar file that you saved earlier.

The instrument will now begin the upgrade process. Note that this will take a while (maybe as much as an hour). **Do not power off while the upgrade is in progress**.



Calnex Solutions plc Oracle Campus Linlithgow West Lothian EH49 7LR United Kingdom

tel: +44 (0) 1506 671 416 email: info@calnexsol.com

calnexsol.com

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