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Anritsu - GRL

PCIe 5.0 CEM Rx Test Application

Release Note

22nd Edition

This software is released for PCIe 5.0 CEM Rx Test.

Table of Contents

Item	Contents
1. Release Software ...Page 2	Provides information for this release.
2. Peripheral Devices ...Page 3	Shows the list of devices that can be controlled by this software.
3. Added Functions ...Page 4	Describes added functions for this release.
4. Bug Fixes ...Page 5	Describes bug fixes in the released software version.
5. Remaining Known Bugs ...Page 5	Describes known software bugs in this version to be fixed in future releases.
6. Usage Notes ...Page 6	Describes precautions for using this software.
7. Troubleshooting ...Page 8	Describes troubleshooting procedures for using this software.
Appendix ...Page 10	Describes Quick Startup Guide.

1. Released Software

The certificate software versions for Keysight / Tektronix Scope are shown in the table.

Edition	GRL Gen5 CEM Rx Test Application	Anritsu MX190000A	Anritsu MX183000A	Scope	
				Keysight	Tektronix
22	V1.10.00	V9.00.01	V9.00.00	DSAZ634A V06.60.00403	DPS77004SX V10.11.0.30
21	V1.08.50	V9.00.01	V9.00.00	DSAZ634A V06.60.00403	DPS77004SX V10.11.0.30
20	V1.08.39	V8.03.14	V8.03.13	DSAZ634A V06.60.00403	DPS77004SX V10.11.0.30
19	V1.08.38	V8.03.14	V8.03.13	DSAZ634A V06.60.00403	DPS77004SX V10.11.0.30
18	V1.08.29	V8.03.14	V8.03.13	DSAZ634A V06.60.00403	DPS77004SX V10.11.0.30
17	V1.08.08	V8.03.00	V8.03.02	DSAZ634A V06.60.00403	DPS77004SX V10.11.0.30
16	V1.08.08	V8.03.00	V8.03.00	DSAZ634A V06.60.00403	DPS77004SX V10.11.0.30
15	V1.08.08	V8.02.00	V8.01.31	DSAZ634A V06.60.00403	DPS77004SX V10.11.0.30
14	V1.08.00	V8.02.00	V8.01.31	DSAZ634A V06.60.00403	DPS77004SX V10.11.0.30
13	V1.08.00	V8.01.31	V8.01.31	DSAZ634A V06.60.00403	DPS77004SX V10.11.0.30
12	V1.08.00	V8.00.30	V8.00.30	DSAZ634A V06.60.00403	DPS77004SX V10.11.0.30
11	V1.00.64	V8.00.30	V8.00.30	DSAZ634A V06.60.00403	DPS77004SX V10.11.0.30
10	V1.00.64	V7.02.30	V7.02.30	DSAZ634A V06.60.00403	DPS77004SX V10.11.0.30
09	V1.00.57	V6.01.05	V6.00.05	DSAZ634A V06.60.00403	DPS77004SX V10.11.0.30
08	V1.00.54	V5.01.00	V5.00.30	DSAZ634A V06.60.00403	DPS77004SX V10.11.0.30
07	V1.00.45	V4.10.20	V4.10.05	DSAZ634A V06.55.00702	DPS77004SX V10.1.0.34
06	V1.00.42	V4.10.20	V4.10.05	DSAZ634A V06.55.00702	DPS77004SX V10.1.0.34
05	V1.00.34	V4.09.50	V4.09.15	DSAZ634A V06.55.00702	DPS77004SX V10.1.0.34
04	V1.00.32	V4.09.41	V4.09.15	DSAZ634A V06.55.00702	DPS77004SX V10.1.0.34
03	V1.00.26	V4.07.23	V4.06.03	DSAZ634A V06.55.00702	DPS77004SX V10.1.0.34
02	V1.00.00	V4.03.12	V4.03.15	DSAZ634A V06.40.00714	DPS75904SX V10.0.8.138
01	V1.00.00	V4.03.12	V4.03.15	DSAZ634A V06.40.00714	DPO75902SX V10.0.8.138

2. Peripheral Devices

The peripheral devices of the application are shown in the table.

Model	Name
MP1900A	Signal Quality Analyzer-R
MU181000B	12.5GHz 4port Synthesizer (Option-02 is required.)
MU181500B	Jitter Modulation Source
MU195020A or MU196020A	21G/32G bit/s SI PPG or PAM4 PPG
MU195040A	21G/32G bit/s SI ED
MU195050A	Noise Generator

If you need help for the installation position of the mainframe, refer to the Anritsu website.
(https://www.anritsu.com)

3. Added Functions

Version	Description
V1.08.39	Improves algorithms of both "Preset 4 Calibration" and “Launch Amplitude Calibration”.
V1.08.38	Adds "Brute Force Method". If set to “True”, DM Optimization SJ will continue scan across entire SJ range. Changes "DM optimization Target" default from “Eye Width” to "Eye Height".
V1.08.29	Adds parameters for DM Optimization and Final Eye Calibration Adds "Skip if waveform exist" to allow efficiency in retesting without recapturing all preset waveforms
V1.00.64	Updates MOI
V1.00.54	Changes calibration flow according to the latest FYI test Updates MOI
V1.00.45	Uses EyeCal template for TP2 calibration
V1.00.42	Supports SigTest Phoenix version 5.0.15
V1.00.34	Turns OFF PPG output after completing tests and when changing ISI
V1.00.32	Supports MU196020A PAM4 PPG
V1.00.25	Supports Tektronix ATI configuration Supports Seasim for calibration Supports SigTest Phoenix

4. Bug Fixes

Version	Description
V1.10.00	Fixes Preset calibration failure with Keysight UXR scope. Fixes RJ and SJ calibration failure with Keysight UXR EZJIT application.
V1.08.38	Fixed one of the SJ options in DM Optimization SJ Scan Range from 0.012 UI to 0.12 UI.
V1.08.08	Fixed newly set CTLE value not being applied after Link Training has failed.
V1.00.57	Fixed “CM/DM” calibration not being completed with Tektronix scope.
V1.00.45	Fixed config "PPG Final Preset" not being applied when changed to fixed preset.
	Updated framework to fix Jitter tolerance plot displaying incorrect JTOL line.

5. Remaining Known Bugs

None

6. Usage Notes

The precautions for using each version are described below.

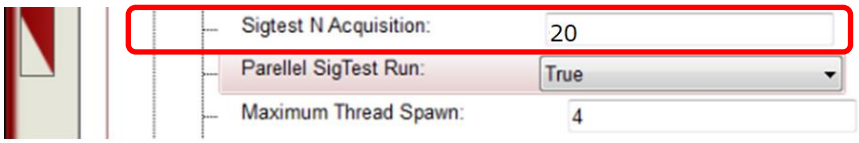
6.1 Functional restrictions on GRL software

The following tests cannot be performed with GRL Automation software, because SigTest V4.0.52, the latest release as of January 2020, does not support the features required for PCIe 5.0 Preset Test. When SigTest adds support for the features required for Preset Test, we will update the software so that these tests can be performed.

- Tx initial Link EQ
- Deemphasis / Preshoot Analysis of Tx EQ Response Time (Preset / Cursor)

SigTest may return zero when calibrating EH/EW, but the test specifications define that the processing should exclude zero.
SigTest that supports PCIe 5.0 has a higher probability of returning zero than SigTest that supports PCIe 4.0. Thus, it may not calibrate EH/EW properly if **Eye Width/Height SigTest N Acquisition** is only **7**, although it is enough for PCIe 4.0. Therefore, set **Eye Width/Height SigTest N Acquisition** to **20** for PCIe 5.0.
The issue is expected to be improved by future upgrades of SigTest.

Eye Width/Height SigTest N Acquisition: 7 => 20



6.2 Note on Apply Embedding

Basically, in order to comply with the PCIe standard:

- Use a scope with the Embedded function installed.
- With the GRL software, set **Apply Embedding** (4 dB for AIC, 9 dB for System on the scope) to **True**.

This section explains an alternative (optional) procedure for performing calibration when using a scope without the Embedded function installed.

In order to use the Embed function, the InfiniiSim waveform transformation toolset (Option N5465A InfiniiSim or D9020ASIA InfiniiSimAdv) is required on the Keysight scope. If the option is not installed on the scope, set the parameter to **False**. Note that no option is required for Tektronix scopes.

7. Troubleshooting

If you encounter any errors during calibration or testing, check as follows.

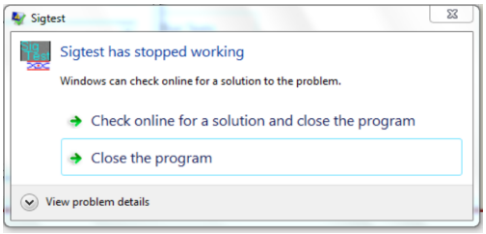
7.1 Calibration

7.1.1 In case of an error when calibrating **Amplitude**, **Preset**, **SJ** and **RJ**

- Check the RF connections. Especially, the connection polarity (Pos/Neg) and the trigger connections (PPG Aux Out and Scope Aux In) are easy to mistake.
- Check the software version. A different version of software may cause an unexpected error.
- Check the SigTest version. SigTest version needs to be 4.0.51. Also, this should be installed to the directory C:¥Program Files (x86). Do not change the installation directory from the default setting.

7.1.2 In case of a SigTest error when performing Long Channel Calibration

A SigTest error message is displayed and SigTest has stopped working when calibrating SJ, RJ and EH/EW. Since this message has no effect on calibration results, click **Close the program** to continue the calibration.



To avoid this message:

- Close all applications except the GRL software, MX190000A, MX183000A and scope applications. Especially when VNC is running, SigTest may not work properly.
- If you see this message frequently despite not running other applications on the PC, use another PC with the GRL software installed.

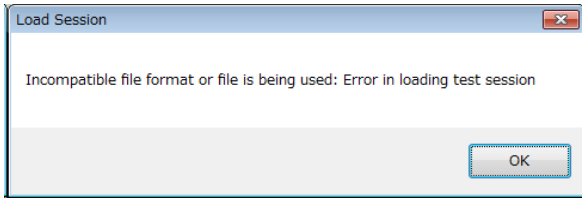
7.1.3 When Final Eye calibration fails

- Use the ISI Trace properly calibrated to 34 to 37 dB. It is recommended to use the calibration fixture distributed by the PCI-SIG.
- If any components (DC block, Power Divider, Attenuator and Adaptor) are attached to the Noise module output, remove them. These components may affect the waveform.

7.2 Others

7.2.1 When a session file cannot be loaded

- Close the folder where you installed the GRL software and saved PDF report file(s) because the loaded session file accesses and edits the folder.



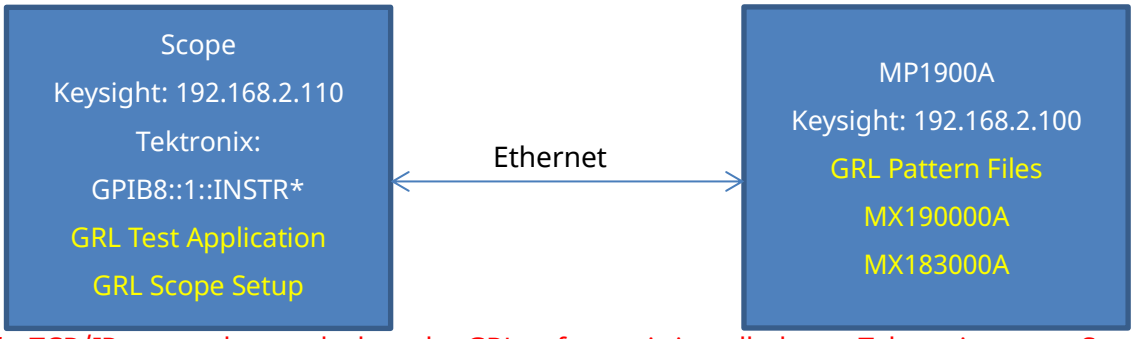
- While recalling the session file on CEM spec takes several minutes, it does not mean that the computer is frozen. Wait until the recalling is completed. This function recalls large waveform files which are acquired by Tx initial EQ and Tx LEQ Response time test.

Appendix

A. Quick Startup Guide

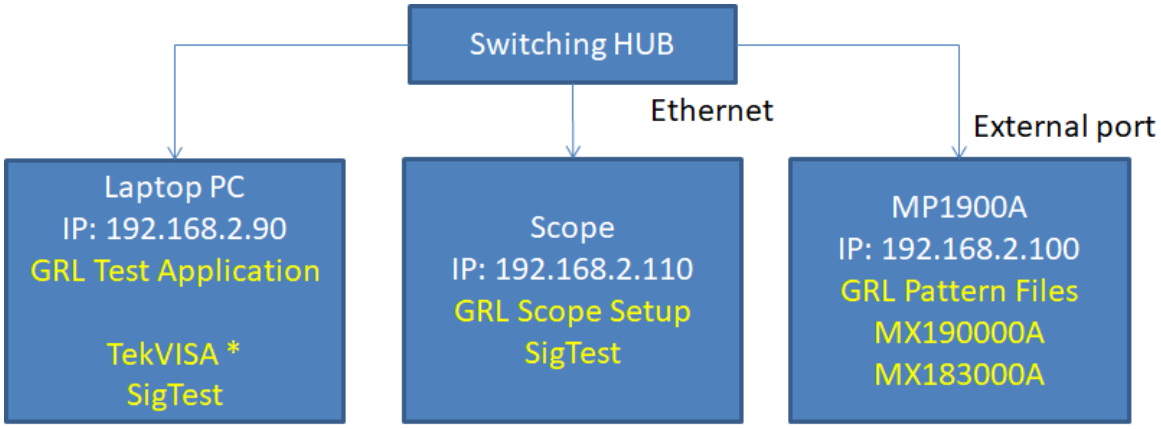
1. Connect instruments with Ethernet cables as shown below.
2. Set the IP and GPIB addresses as shown below. These can be set in the Network and Sharing Center (Windows OS feature).
3. Install all applications as shown below (Yellow letters).

- Recommended connection



* TCP/IP cannot be used when the GRL software is installed on a Tektronix scope. Set the GPIB address as “GPIB8::1::INSTR”.

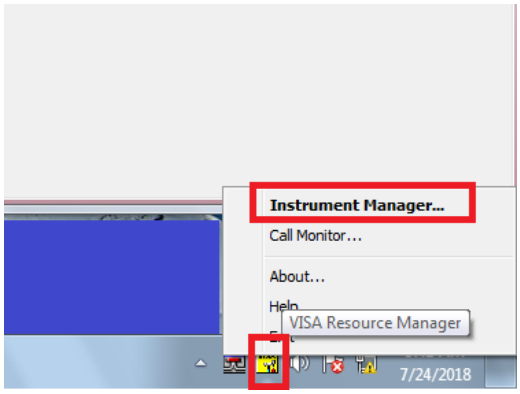
- Optional connection

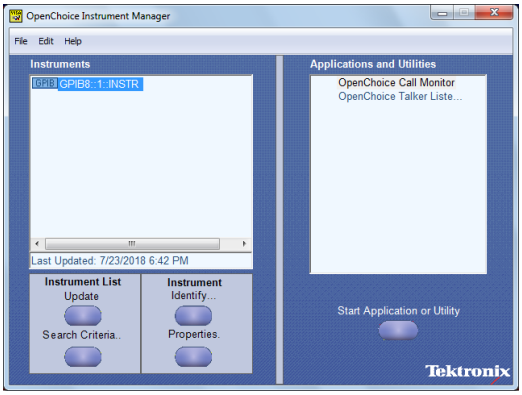


* TekVISA is needed to control Tektronix scopes. But, the PC on which TekVISA is installed cannot control Keysight scopes. Also, this configuration makes the remote control speed slower than the recommended configuration.

4. Launch application and configure equipment settings.
   Enter the scope address as below, and click . If the setting and connection are correct, the button will turn green.

Tektronix Scope
When the GRL software is installed on the laptop:
TCPIP0::192.168.2.110::inst0::INSTR
When the GRL software is installed on the scope: GPIBX::1::INSTR*
* Tektronix scope cannot use TCP/IP when the GRL software is installed on it. In this case, GPIB VISA should be set. The address can be checked using the VISA instruments Manager.





Keysight Scope
When the GRL software is installed on the laptop:
TCPIP0::192.168.2.110::inst0::INSTR
When the GRL software is installed on the scope: TCPIP0::localhost::inst0::INSTR

MX190000A: TCPIP0::192.168.2.100::5001::SOCKET*
MX183000A: TCPIP0::192.168.2.100::5000::SOCKET*
* Port numbers should be set for MX190000A and MX183000A.