

D9042DPPC DisplayPort UHBR Compliance Test Application

Keysight D9042DPPC Software Version 1.50.1.0

Release Date:	November 08, 2024
Operating System:	Microsoft Windows 10
Minimum Instrument Software Version:	11.60.00115 (UXR-Series) 06.74.01101 (V-Series and Z-Series)
Test Controller (e.g., UCD300) Version:	1.12.7 (UCD-323, UCD-300-UFG06-SW-Bundle), 2.4.0 (UX), 1.3.4 (UF), 1.1.3 (BF), 1.4.3 (BN), or 0.21.201 (MC)
File Name:	SetupD9042DPPC_DisplayPort_UHBR_1.50.1.0.exe
Licenses:	Please see the product data sheet on Keysight.com.

Issues Fixed

Fixed the “Waveform is missing” error in the “Measure and Report” mode project, which appeared when executed with an optimum preset or CTLE setting other than P0/0dB.

Known Issues

- When using a license from the Remote License Server via PathWave License Manager, the app might be listed as “Unlicensed App” in Infiniium. However, the app will still run correctly if the license is present.
- Tests’ status in **Select Tests** tab might not change on creating a new project.
- The FVT test might not be able to locate the overshoot or perform any other measurements correctly if the overshoot is not present in the clock switch pattern.

Notes / Recommendations

- Projects saved in app version below 1.40.0.0, will be loaded as read-only/settings-only.
- When running “Preset BEST_TP2” or “Preset PASS_TP3 and CTLE-DFE PASS_TP3” tests together with other tests, the optimal preset configuration will not get updated automatically. It is recommended to run them separately.
- Please ignore any error messages which might be displayed while uploading results to PathWave Measurement Analytics repository. The upload process will complete successfully irrespective of these intermittent errors.

Keysight D9042DPPC Software Version 1.50.0.0

Release Date:	June 17, 2024
Operating System:	Microsoft Windows 10
Minimum Instrument Software Version:	11.60.00115 (UXR-Series) 06.74.01101 (V-Series and Z-Series)
Test Controller (e.g., UCD300) Version:	1.12.7 (UCD-323, UCD-300-UFG06-SW-Bundle), 2.4.0 (UX), 1.3.4 (UF), 1.1.3 (BF), 1.4.3 (BN), or 0.21.201 (MC)
File Name:	SetupD9042DPPC_DisplayPort_UHBR_1.50.0.0.exe
Licenses:	Please see the product data sheet on Keysight.com.

New Features / Additions

- Added differential and common mode connection support.
- Added probe support.
The following probes are supported by the D9042DPPC DisplayPort UHBR Compliance Test Application:
 - o MX0025A InfiniiMax Ultra Probe Amplifier, 25 GHz
 - o N2802A InfiniiMax III Series Probe Amplifier, 25 GHz
 - o N2803A InfiniiMax III Series Probe Amplifier, 30 GHz

Modifications / Changes

- Updated default filtering methodology for “Frequency Variation Training (FVT)” test to utilize 5 MHz Low Pass Filter.
- Updated default behavior for FVT test pattern request. The app will now first request for SQ2 pattern instead of directly proceeding to request for clock switch.
- Updated default scope bandwidth for UHBR13.5 from 20 GHz to 21 GHz.

Issues Fixed

- Mitigated an issue where overshoot was not being detected correctly in “Frequency Variation Training” test, if overshoot did not exist in the clock switch profile.
- Fixed an issue where SSC modulation results on one lane were being duplicated to other lanes when running in single instance mode.
- Fixed an issue where some part of the allowable range in “Sampling Size” setting for Jitter tests in **Config** tab was invalid.
- Fixed an issue where app sometimes reported “The positive and negative signal memory mismatch” error when trying to run “Source Transmitter Equalization” test.

- Fixed an issue where the config “Cable Model” option set as “Disable” does not disable the cable model.
- Fixed an issue where the Type-C controller setup crashed if trying to connect to a variable power supply with an invalid VISA address.

Known Issues

- Tests' status in **Select Tests** tab might not change on creating a new project.
- The FVT test might not be able to locate the overshoot and perform other measurements correctly if the overshoot is not available in the clock switch pattern.

Notes / Recommendations

- Projects saved in app version below 1.40.0.0, will be loaded as read-only/settings-only.
- When running “Preset BEST_TP2” or “Preset PASS_TP3 and CTLE-DFE PASS_TP3” tests together with other tests, the optimal preset configuration will not get updated automatically. It is recommended to run them separately.
- Please ignore any error messages which might be displayed while uploading results to PathWave Measurement Analytics repository. The upload process will complete successfully irrespective of these intermittent errors.

Keysight D9042DPPC Software Version 1.40.0.0

Release Date:	November 20, 2023
Operating System:	Microsoft Windows 10
Minimum Instrument Software Version:	11.50.00601 (UXR-Series) 06.74.00402 (V-Series and Z-Series)
Test Controller (e.g., UCD300 version):	1.12.7 (UCD-323, UCD-300-UFG06-SW-Bundle), 2.4.0 (UX), 1.3.4 (UF), 1.1.3 (BF), 1.4.3 (BN), 0.21.201 (MC)
File Name:	SetupD9042DPPC_DisplayPort_UHBR_1.40.0.0.exe

New Features / Additions

- Updated the app to Framework v7.20.
- Added support for multi-lane acquisition. The test application will be able to acquire waveforms from both lanes at once during acquisition phase on supported scopes (Z-Series and UXR).
- App now allows users to choose if DUT supports SSC. SSC related tests will be disabled if **SSC Support** check box is not selected.
App Path: **Set Up** tab > **DUT** section > **SSC Support** check box
- App now allows users to choose if DUT is connected to re-timer. If **Re-timer** check box is selected, re-timer related tests will be enabled.
App Path: **Set Up** tab > **DUT** section > **Re-timer** check box

- Preset BEST_TP2 (previously known as Preset Calibration (TP2)) test and Preset PASS_TP3 and CTLE-DFE PASS_TP3 (previously known as Preset and Equalization Calibration (TP3)) test now support custom pattern. Now, user can select either **PRBS15**, **PRBS31**, or **Arbitrary** pattern for certain tests with the **Pattern Type** drop down configuration available in the **Configure** tab.
- “Frequency Variation Measurement” test now can be automated using Unigraf UCD-323 Automation Controller.

Modifications / Changes

- Connection diagrams have been updated to include instructions for UCD controller and Type-C controller connections.
- “1m Cable” is now renamed as “1m Cable N2328A”.
- Type-C controller user message is updated to provide clarity on power supply connections.
- Configuration for Preset BEST_TP2 and Preset PASS_TP3 and CTLE-DFE PASS_TP3 Sampling Size is consolidated to their respective sections in **Configure** tab.
- Preset PASS_TP3 and CTLE-DFE PASS_TP3 tests will now be compared with eye limits and outcome will be reported if best case scenario is within limits and the margin. This comparison will not affect the pass/fail result of the test.
- Updates based on VESA DisplayPort v2.1 PHY Layer Compliance Test Specification Revision 1.0 (June 12, 2023)
 - o Test name update has been performed for the following tests:

Old Name	New Name
Preset Calibration (TP2)	Preset BEST_TP2
Preset and Equalization Calibration (TP3_EQ)	Preset PASS_TP3 and CTLE-DFE PASS_TP3
Unit Interval, Min	Minimum Unit Interval, Min
Unit Interval, Max	Minimum Unit Interval, Max
Bit Rate, Average	Average Minimum Bit Rate
Eye Diagram	TP2 EYE Diagram
Eye Diagram (TP3_EQ)	TP3_EQ EYE Diagram
Total Jitter	TP2 Total Jitter

Random Jitter	TP2 Random Jitter
Uncorrelated Jitter	TP2 Uncorrelated Jitter
Uncorrelated Deterministic Jitter	TP2 Uncorrelated Deterministic Jitter
Data Dependent Jitter	TP2 Data Dependent Jitter
Inter Symbol Interference	TP2 Inter Symbol Interference
Duty Cycle Distortion	TP2 Duty Cycle Distortion
Low Frequency Uncorrelated Deterministic Jitter	TP2 Low Frequency Uncorrelated Deterministic Jitter
Total Jitter (TP3_EQ)	TP3_CTLE Total Jitter
Random Jitter (TP3_EQ)	TP3_CTLE Random Jitter
Uncorrelated Jitter (TP3_EQ)	TP3_CTLE Uncorrelated Jitter
Uncorrelated Deterministic Jitter (TP3_EQ)	TP3_CTLE Uncorrelated Deterministic Jitter
Data Dependent Jitter (TP3_EQ)	TP3_CTLE Data Dependent Jitter
Inter Symbol Interference (TP3_EQ)	TP3_CTLE Inter Symbol Interference
AC Common Mode Voltage	AC Common Mode Noise
Equalization Test Preset N	Source Transmitter Equalization Preset N
Equalization Swing Preset 15	Source Transmitter Equalization Swing Preset 15

- Main Link Frequency test is now moved to informative as it is not listed in the specification.
- Frequency Variation Training Measurement test now uses updated test pattern as listed in specification, instead of the older SQ128 -> PRBS31 transition pattern.
- Preset PASS_TP3 and CTLE-DFE PASS_TP3 test default measurement configuration is updated. Changes as shown below:

Default Configuration	Old	Updated
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Optimization Criteria	Max Eye Area	Max Eye Area
Scope Time Capture	Equivalent to 1M UI	Equivalent to 1M UI
Acquisition Count	5	1
Interpolation	16x	Off

Issues Fixed

- Fixed an issue where the default SSC window size was incorrect for UHBR13.5. The default value has been changed from 3000 to 4000.
- Fixed an issue where DFE was not correctly set up when transitioning to next CTLE configuration in Preset and Equalization (TP3) tests.
- Fixed an issue where not all items were being included in the reporting summary table when tests are performed in multiple trials.
- Fixed an issue where the “Acquisition Setting” field is inaccurate for some tests during reporting.
- Fixed an issue where-in inconsistent behavior was observed for “Bit Rate” check boxes in **Set Up** tab on changing “Connector Type”.

Known Issues

- Tests’ status in **Select Tests** tab might not change on creating a new project.

Notes / Recommendations

- Project version below v1.40 will be loaded as read-only/settings-only due to a recent change on Power Profile.
- When running “Preset BEST_TP2” or “Preset PASS_TP3 and CTLE-DFE PASS_TP3” tests together with other tests, the optimal preset configuration will not get updated automatically.

It is recommended to run them separately.

Keysight D9042DPPC Software Version 1.30.0.0

Release Date:	April 20, 2023
Requirements Category (e.g., operating system):	Microsoft Windows 10
Requirements Category (e.g., minimum instrument software version):	11.40.00401 (UXR-Series) 06.73.00102 (V-Series and Z-Series)
File Name:	SetupD9042DPPC_DisplayPort_UHBR_1.30.0.0.exe

New Features / Additions

- App updated to run on Acquire Now and Process Later (ANPL) mode.
- All tests except preset calibration and equalization have been updated to support Keysight **D9010AGGC Compliance Test Software Measurement Server** for using multiple machines/PCs over a network as processing engines in order to significantly enhance the test execution speed. To know more, please visit the D9010AGGC product page at www.keysight.com.
- Added **Connection Setup** option in **Set Up** tab.
- **Eye Diagram** tests have been enhanced to report mask limits.
- Added ability to define interconnect skew per lane in **Configure** tab.

Modifications / Changes

- **Enable Cable De-embed** and **Enable Fixture De-Embed** check boxes in **Test Setup** dialog box will now be pre-selected by default.
- App will show a warning during run if skew calibration is not performed.
- Replaced Converged IO Specification with DisplayPort 2.1 CTS as reference.
- Updates based on DisplayPort 2.1 Spec and DisplayPort 2.1 CTS:
 - o “mDP” and “Standard DP” **Connector Types** have been renamed to “Enhanced mDP” and “Enhanced FsDP”.
 - o Enhanced FsDP connector now supports tests for UHBR10, UHBR13.5, and UHBR20 bit rates, instead of only UHBR10.
 - o Updated Cable Model files

USB Type-C	UHBR10	USB4_Gen2_2m.s4p
	UHBR13.5	DP80_cable.s4p
	UHBR20	DP80_cable.s4p
Enhanced FsDP	UHBR10	DP40_cable_candidate3.s4p
	UHBR13.5	DP80_cable.s4p
	UHBR20	DP80_cable.s4p
Enhanced mDP	UHBR10	DP40_cable_candidate3.s4p
	UHBR13.5	DP80_cable.s4p
	UHBR20	DP80_cable.s4p

- o New tests added
 - Bit Rate
 - Frequency Variation Measurement (No UCD-323 support in this release)
- o Tests moved to informative
 - Unit Interval
 - Peak to Peak Voltage

- Random Jitter
- Data Dependent Jitter
- Total Jitter TP3_EQ
- Random Jitter TP3_EQ
- Uncorrelated Jitter TP3_EQ
- Uncorrelated Deterministic Jitter TP3_EQ
- Data Dependent Jitter TP3_EQ
- Tests removed
 - Rise Time
 - Fall Time
- Changed SSC Filter Window for UHBR13.5 from 3000 to 4000.

Issues Fixed

- Resolved the issue wherein after loading a switch matrix enabled project, if tests were run with switch matrix, run abort error was being observed.

Known Issues

- Inconsistent behavior might be observed for “Bit Rate” check boxes in **Set Up** tab on changing “Connector Type”.
- Tests’ status in **Select Tests** tab might not change on creating a new project.

Notes / Recommendations

- When running “Preset Calibration” or “Preset and Equalization Calibration” tests together with other tests, the optimal preset configuration will not get updated automatically.

It is recommended to run them separately.

Keysight D9042DPPC Software Version 1.20.0.0

Release Date:	July 25, 2022
Requirements Category (e.g., operating system):	Microsoft Windows 10
Requirements Category (e.g., minimum instrument software version):	11.30.00202 (UXR-Series) 06.71.00202 (V-Series and Z-Series)
File Name:	SetupInfDisplayPort201200000.exe

New Features / Additions

- Added Unigraf UCD-323 Controller support for automation tests. User can now enable UCD-323 automated tests by selecting **Enable Automation** check box in the **Set Up** tab and then the **Unigraf_UCD_323_G2** option from the dropdown.

Modifications / Changes

- Updated format for **Equalization Tests**. Equalization test items are now grouped based on preset number, and user can select which preset to run. Each preset would run both pre-shoot and de-emphasis tests.
- Implemented Method 2 (pre- and post- cursor not applied to main cursor) for **Transmitter Swing Preset 15 Test**.
- Changed RJ separation method for **Jitter Tests** from “Spectral and Tail Fit” to “Spectral Only”.
- Updated Uncorrelated Jitter (UJ) calculation method from $UJ = TJ - DDJ$ (ISI Only) to $UJ = TJ - DDJ$.
- Test limits aligned to the spec “VESA DisplayPort (DP) Standard Version 2.1, Revision 16 (Development Copy)”.
- **Connector Type** option “mDP/Standard DP” in **Set Up** tab has now been separated into two different options, i.e., Standard DP and mDP. New options are as follows:
 - o USB Type-C
 - o Standard DP
 - o mDP

Issues Fixed

- Corrected **SSC Phase Deviation Test** unit as “ns pp” from earlier “ns”.
- Fixed **Lane 3 – Peak To Peak Voltage Test** to use CHAN2/CHAN4 as signal source, instead of the earlier CHAN1/CHAN3.

Notes / Recommendations

- Please ensure that the Unigraf UCD-323 Controller is installed with the firmware version as listed below to run the UCD-323 automation correctly.

UX	2.3.0
UF	1.3.4
BF	1.1.3/1.4.3
MC	0.21.170

- Project files saved using earlier versions of the application will open in the current version (1.20.0.0) in read-only mode.
- D9042DPPC DisplayPort UHBR Test Application no longer supports Microsoft Windows 7. Hence, this application is no longer being tested to work on the mentioned operating system. However, users may still be able to use the app on Windows 7 with .NET Runtime 4.7.2.

Known Issues

- User might experience test status in Select Tests tab not getting reset after creating a new project.
- After loading a switch matrix enabled project, if a user runs tests with switch matrix, run abort error might be observed.

Keysight D9042DPPC Software Version 1.10

Released Date:	27 November 2021
Requirements Category (e.g., operating system):	Microsoft Windows 10, Microsoft Windows 7
Requirements Category (e.g., minimum instrument software version):	10.20.00001 (UXR-Series) 06.70.00001 (V-Series, Z-Series)
File Name:	SetupInfDisplayPort201100000.exe

New Features / Additions

- Supports Data Dependent Jitter and Data Dependent Jitter TP3_EQ tests.
- Added alternative method for Equalization tests (Only applies to pre-shoot and deemphasis test). Configurable in **Configure** tab > **Equalization** > **Equalization Method**. The default selection is **Method 1**.
 - o Method 1: Uses pre and post cursor weight for main cursor when pre-shoot or deemphasis is disabled.
 - o Method 2: Pre- and post-cursor weight is not assigned to main cursor when pre-shoot or de-emphasis is disabled.
- Added Unit Interval Average test.
- Added Peak to Peak Voltage and Peak To Peak Voltage TP3_EQ tests.
- Supports subscription license for bundle software. [SW00DSPP, SW02DSPP]

Modification / Changes

- Updated cable model for Standard DP and Type-C connector.
 - o USB Type-C
 - 10 Gbps: USB4_Gen2_2m.s4p, enabled by default
 - 13.5 Gbps: USB4_Gen3_0p8m.s4p, enabled by default (from disabled by default)
 - 20 Gbps: USB4_Gen3_0p8m.s4p, enabled by default (from disabled by default)
 - o Standard DP
 - 10 Gbps: USB4_Gen2_2m.s4p, enabled by default

- Updated the cable model from disable to auto for 13.5 Gbps and 20.0 Gbps.
- Updated the test point from TP2' to TP2 for 13.5 Gbps and 20 Gbps.
- Updated the Inter Symbol Interference, Inter Symbol Interference TP3_EQ, and Duty Cycle Distortion tests as informative tests.
- Updated the test limit to Info Only for Inter Symbol Interference and Inter Symbol Interference TP3_EQ tests.
- Updated the report item of DDJ to DDJ (ISI Only) for Uncorrelated Jitter and Uncorrelated Jitter TP3_EQ tests.
- Added the report item DCD (second) for Duty Cycle Distortion tests.
- Updated Preset 14 Limit to align with USB4 CTS.
 - o Pre-shoot: 3.6 dB +/- 1 dB (from 3.8 dB +/- 1 dB)
 - o De-emphasis 0 dB +/- 1 dB (from -3.8 dB +/- 1 dB)
- Updated test limits and CTLE parameters to align with DisplayPort (DP) Standard Version 2.1 (Development Copy Rev. 11) (April 30, 2021), changes applied for:
 - o SSC Down Spread Range limit update
 - o UHBR10 Reference Receiver CTLE parameters (AC Gain, Pole 1, and Pole 2)
 - o Jitter Limit updates
 - o Eye Mask File updates
- Updated the RJ to report in peak-to-peak instead of RMS
- Removed outer mask in Eye Diagram and Eye Diagram TP3_EQ tests. Replaced by Peak to Peak Voltage and Peak To Peak Voltage TP3_EQ tests.
- Main CTS Reference changed to USB4 Router Assembly Electrical CTS revision 1.01 (was
- USB Type-C Thunderbolt Alternate Mode Electrical \ Device CTS revision 1.5 version 0.9)
 - o Updated default memory depth used for jitter tests to 40 Mpts (from 27 Mpts)
 - o Updated default bandwidth value for Low Frequency Uncorrelated Jitter Test TIE filter to 0.5 MHz (from 2 MHz)
 - o Updated default config value for Low Frequency Jitter LPF Natural Frequency (wn) to 70 kHz (from 0.8 MHz)
 - o Updated test setup for eye-related tests (Eye Diagram, Preset and Equalization Calibration tests) to apply 16x interpolation.

- Changed default optimization criteria for Preset Calibration (TP2) to Min DDJ (from Max Eye Area)
- Changed signal pattern for Preset Calibration, Preset, and Equalization Calibration tests to PRBS15 when jitter-based optimization criteria are selected. (PRBS31 is still used for eye-based optimization criteria)

Issues Fixed

- Fixed “unable to find transfer function file” error which occurred when the custom fixture de-embed file name or custom cable de-embed file name contained a dot (“.”).
- Fixed “unable to find the transfer function” error which occurred while running the TP3_EQ tests for 13.5 Gbps if the Cable Model was set to "Auto".
- Fixed the issue wherein there was incorrect input signal channel for lane 2 in case of Low Frequency Uncorrelated Deterministic Jitter (UHBR10) test.
- Fixed the issue wherein Preset Calibration contained "Partially Recovered" clock with a recoverable clock signal.

Note / Recommendation

- Application’s project file saved for version 1.00 and below will be opened as settings-only or read-only.

Known Issue

- User might experience test status is not get reset when creating the new project.
- User might experience run abort error when running the tests with switch matrix after loading switch matrix enabled project.
 - Please run the tests with switch matrix without loading the project file.

Keysight D9042DPPC Software Version 1.08

Released Date:	4 August 2021
Requirements Category (e.g., operating system):	Microsoft Windows 10, Microsoft Windows 7
Requirements Category (e.g., minimum instrument software version):	10.25.00702 (UXR-Series) 06.55.00702 (V-Series, Z-Series)
File Name:	SetupInfDisplayPort201000008.exe

Issues Fixed

- Fixed an issue where result for ISI test could be 0 when TJ result is higher than specification limit.
- Fixed an issue where some of the jitter test results are based on the SQ2 pattern instead of PRBS15 pattern when TJ result is higher than specification limit.
- Fixed an issue where the BER config value does not reflect in jitter calculation.

Known Issue

- User will experience unable find transfer function file error if the custom fixture de-embed file name or custom cable de-embed file name contains dot (“.”).
- User might experience test status is not get reset when creating the new project.
- User might experience run abort error when running the tests with switch matrix after loading switch matrix enabled project.
 - o Please run the tests with switch matrix without loading the project file.
- The settings of the switch matrix are not reset and no prompted to enter new address if the user select **“No”** and expect to be prompted to enter new address when loading the project with switch matrix enabled.

Keysight D9042DPPC Software Version 1.00

Released Date:	3 November 2020
Requirements Category (e.g., operating system):	Microsoft Windows 10, Microsoft Windows 7
Requirements Category (e.g., minimum instrument software version):	10.25.00702 (UXR-Series) 06.55.00702 (V-Series, Z-Series)
File Name:	SetupInfDisplayPort201000000.exe

Initial Release

Known Issue

- User will experience unable find transfer function file error if the custom fixture de-embed file name or custom cable de-embed file name contains dot (“.”).
- User might experience test status is not get reset when creating the new project.
- User might experience run abort error when running the tests with switch matrix after loading switch matrix enabled project.
 - o Please run the tests with switch matrix without loading the project file.
- The settings of the switch matrix are not reset and no prompted to enter new address if the user select “No” and expect to be prompted to enter new address when loading the project with switch matrix enabled.

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