

D9042DPPC

DisplayPort UHBR Transmitter Test Software



Keysight Technologies, Inc. DisplayPort UHBR Transmitter Test Software for Infiniium Series oscilloscopes provides a fast and easy way to debug and characterize the physical layer of DisplayPort designs for source ICs, motherboard systems, computers and graphics cards against the DisplayPort 2.0 Specification. D9042DPPC is the perfect tool for silicon validation engineers and its use is highly recommended to DisplayPort Authorized Test Centers.

Features

The DisplayPort UHBR Transmitter Test Software is a full-featured package to simplify the validation process of DisplayPort designs:

- Covers DisplayPort UHBR10, UHBR13.5 and UHBR20 speeds
- Supports DP, mDP and USB-C® connectors
- Setup wizard for guided configuration and test selection
- Cable and test fixture embedding and de-embedding for accurate measurements
- Test report generation in HTML and PDF formats
- Switching solution for automated multilane testing

Comprehensive Test Coverage

DisplayPort electrical testing is a complex task as it requires the connection of the product under test to the test instrument with specific test point access fixtures, the configuration and execution of advanced measurements and, finally, the evaluation of test results against the limits described in the specification. The sources of errors are too high to take any risks. The DisplayPort UHBR Transmitter Test Software greatly reduces the chances of failure and the time spent in testing by providing a guided setup and automated configuration of the test instrument and interpretation of test results. That way, you can leave the complexity of the test setup to the application and focus on the most important: the product under test.

Easy Test Setup

The DisplayPort UHBR Tx Test software blends the advanced measurements of Keysight's Infiniium Series oscilloscopes with an intuitive user interface to provide unmatched testing capabilities. It is as simple as entering DUT attributes like connector type, lane under test and bitrates, and the application takes care of guiding the user through all necessary configuration steps to ensure the correctness of the test execution.

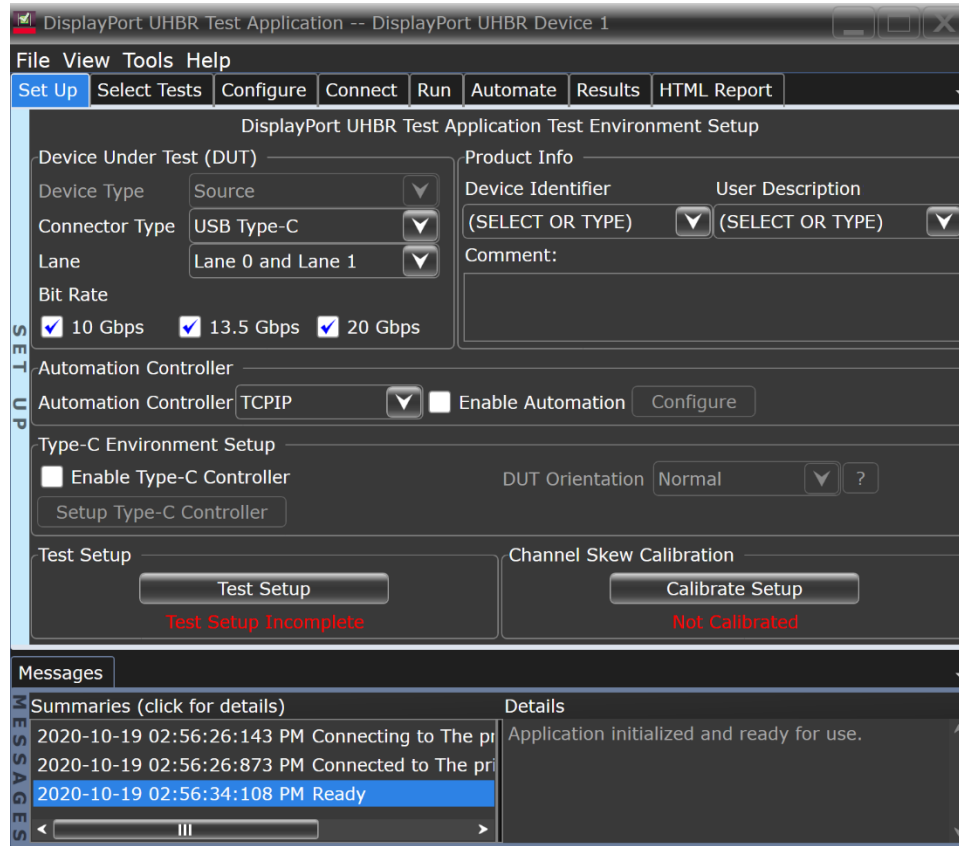


Figure 1. DisplayPort UHBR Tx Test software main screen

Equalization Optimization

The DisplayPort 2.0 Specification defines new, complex equalization schemes to compensate the channel effects, which become severe at the ultra-high bitrates. These comprehend transmitter Feed-Forward Equalization (FFE) on the DP Source, and receiver Continuous-Time Linear Equalization (CTLE) combined with Decision Feedback Equalization (DFE) on the DP Sink. In normal operation, the fine-tuning of the equalization settings during link training is key for an error-free communication.

DisplayPort defines two test points for Source testing: TP2 and TP3EQ. TP2 is located at the test interface on a mated Test Point Access fixture connected to the DP Source port. At TP2, the only equalization scheme present is the transmitter FFE. TP3EQ is located at the test interface on a mated Test Point Access fixture connected to the DP Sink port, using a defined cable model, with equalization enabled. At TP3EQ, all equalization schemes mentioned previously are present.

The DisplayPort UHBR Tx Test software gives you full control of the link equalization. The software can run an optimization, sweeping the transmitter FFE preset at TP2 and the transmitter FFE preset vs the receiver CTLE DC gain at TP3EQ. Then, the software will use the best settings for the Source tests based on the optimization criteria defined by the user: maximum eye height, eye width or eye area, or minimum inter-symbol interference or data-dependent jitter. If the user prefers to run the Source tests with predefined settings, it is also possible to enter them directly and skip the optimization phase.

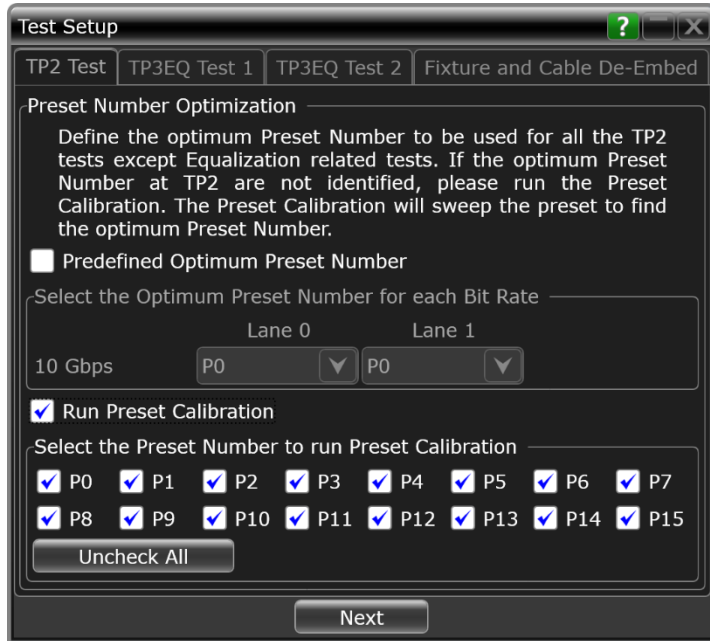


Figure 2. Tx FFE preset optimization at TP2

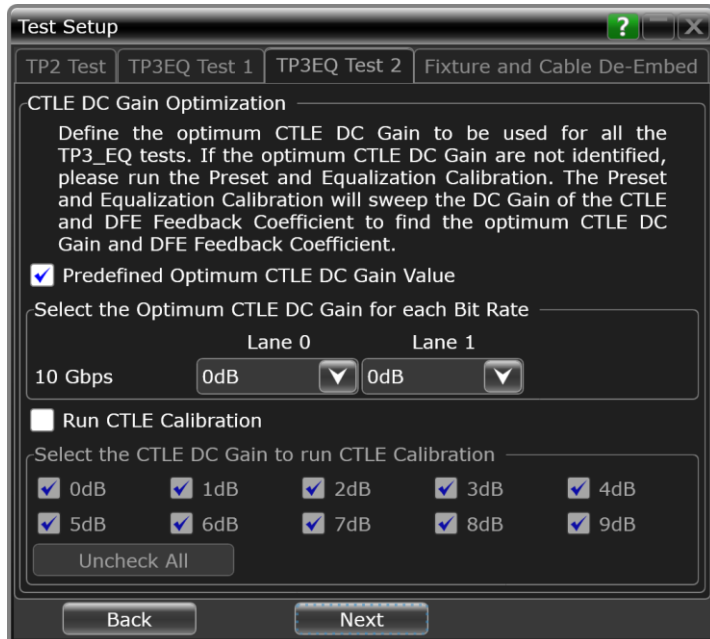


Figure 3. Rx CTLE DC gain optimization at TP3EQ

Fixture and Cable De-embedding

The software allows to remove the effect of the test point access fixtures and RF cables used for the measurements. To do so, simply enable the de-embedding options and specify the corresponding S-Parameter files. The flexible configuration allows to use the same S-Parameter file for all tested lanes, or different S-Parameter files per tested lane for a most accurate setup. The software will generate the corresponding transfer functions and use them during the tests.

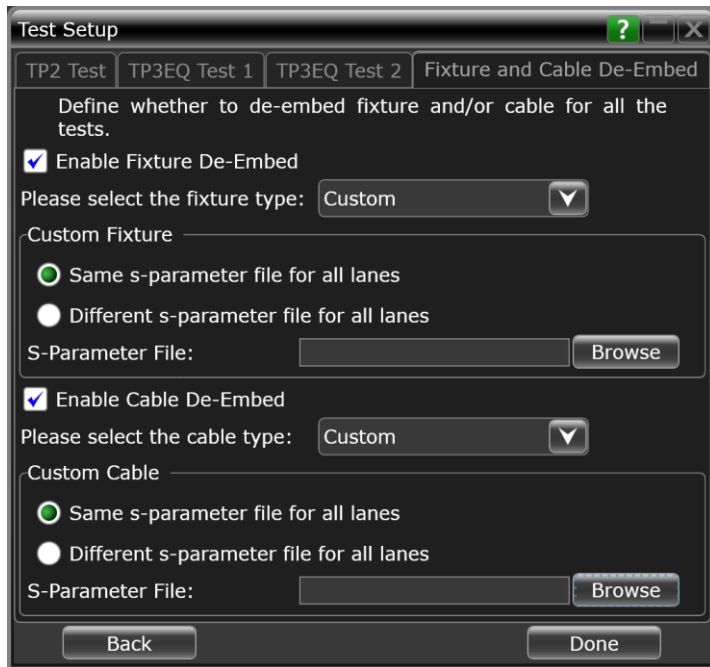


Figure 4. Fixture and cable de-embedding features

Automation

You can completely automate execution of your application's tests and Add-Ins from a separate PC using the included Remote Interface feature (visit www.keysight.com/find/scope-apps-sw to download a free toolkit). You can even create and execute automation scripts right inside the application using a convenient built-in client.

The commands required for each task may be created using a command wizard or from "remote hints" accessible throughout the user interface. Using automation, you can accelerate complex testing scenarios and even automate manual tasks such as:

- Opening projects, executing tests and saving results
- Executing tests repeatedly while changing configurations
- Sending commands to external instruments
- Executing tests in a different order than pre-established

Combine the power of built-in automation and extensibility to transform your application into a complete test suite:

- Interact with your device controller to place it into desired states or test modes before test execution.
- Configure additional instruments used in your test suite such as a pattern generator and probe switch matrix.
- Export data generated by your tests and post-process it using your favorite environment, such as MATLAB, Python, LabVIEW, C, C++, Visual Basic etc.
- Sequence or repeat the tests and “Add-In” custom steps execution in any order for complete test coverage of the test plan.

Switch matrix

The Keysight switch matrix software option for the Tx test application, used together with switch matrix hardware, enables fully automated testing for multi-lane digital bus interfaces. The benefits of this automated switching solution include:

- Eliminate reconnections, which saves time and reduces errors through automating test setup for each lane of a multi-lane bus.
- Maintain accuracy with the use of unique PrecisionProbe or InfiniiSim features to compensate for switch path losses and skew.
- Customize testing by using remote programming interface and the user-defined application tool for device control, instrument control and test customization.

Ordering Information

Recommended oscilloscope

The DisplayPort UHBR Transmitter Test Software is compatible with the following Infiniium series oscilloscopes:

Data rate	Recommended bandwidth	Oscilloscope
Up to UHBR10 (10 Gb/s)	16 GHz minimum	Infiniium V, Z and UXR series
Up to UHBR13.5 (13.5 Gb/s)	21 GHz minimum	Infiniium V, Z and UXR series
Up to UHBR20 (20 Gb/s)	21 GHz minimum	Infiniium V, Z and UXR series

Infiniium software

Model number	Description	Note
D9020ASIA	Advanced Signal Integrity Software (EQ, InfiniiSim Advanced)	Required
D9020JITA	Jitter, Vertical and Phase Noise Analysis Software	Required
D9010DMBA	Precision Cable Calibration	Optional
D9020SCNA	InfiniiScan Event Identification Software	Optional
KS6810A	Data Analytics software (1 license)	Optional

Flexible Software Licensing and KeysightCare Software Support Subscriptions

Keysight offers a variety of flexible licensing options to fit your needs and budget. Choose your license term, license type, and KeysightCare software support subscription.

License Terms

Perpetual – Perpetual licenses can be used indefinitely.

Subscription – Subscription licenses can be used through the term of the license only (6, 12, 24, or 36 months).

License Types

Node-locked – License can be used on one specified instrument/computer.

Transportable – License can be used on one instrument/computer at a time but may be transferred to another using Keysight Software Manager (internet connection required).

USB Portable – License can be used on one instrument/computer at a time but may be transferred to another using a certified USB dongle (available for additional purchase with Keysight part number E8900-D10).

Floating (single site) – Networked instruments/computers can access a license from a server one at a time. Multiple licenses can be purchased for concurrent usage.

KeysightCare Software Support Subscriptions

Perpetual licenses are sold with a 12 (default), 24, 36, or 60-month software support subscription. Support subscriptions can be renewed for a fee after that.

Subscription licenses include software support through the term of the license.



KeysightCare Software Support Subscription provides peace of mind amid evolving technologies.

- Ensure your software is always current with the latest enhancements and measurement standards.
- Gain additional insight into your problems with live access to our team of technical experts.
- Stay on schedule with fast turnaround times and priority

Selecting your license

Step 1. Choose your software product (e.g. S1234567A).

Step 2. Choose your license term: perpetual or subscription.

Step 3. Choose your license type: node-locked, transportable, USB portable, or floating.

Step 4. Depending on the license term, choose your support subscription duration.

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