

D90203UAC UALink Transmitter

Measurement and Compliance Application Software

Characterize UALink Electrical Transmitter Designs using Infiniium UXR-Series Real-Time Oscilloscopes



Introduction

The D90203UAC application is a dedicated transmitter compliance test solution for UALink devices, enabling high-speed physical layer validation within advanced computing and AI interconnect systems. Designed for use with high-bandwidth oscilloscopes, it automates critical electrical measurements to ensure signal integrity and standard compliance at 200 Gb/s link speeds.

This solution provides automated test execution, waveform analysis, and pass/fail result generation across key transmitter parameters such as jitter, voltage swing, rise/fall time, and eye quality. Built specifically for KR and CR channel types, the application supports comprehensive single-lane TX validation workflows.

The software integrates seamlessly with Keysight's UXR-series oscilloscopes, leveraging advanced measurement automation to reduce test time, improving consistency, and supporting faster design iteration across validation cycles.

Keysight D90203UAC UALink Transmitter Software

Designed for next-generation interconnects, the D90203UAC provides the tools needed to validate UALink TX electrical performance with confidence, speed, and precision.

Transform Complexity into Simplicity

The D90203UAC simplifies the complexity of UALink testing with:

- Fully automated testing of many physical layer test cases
- Saves time and reduces errors in compliance workflows
- Seamless automation for setup, execution, and reporting
- Integration with Infiniium UXR-Series oscilloscopes

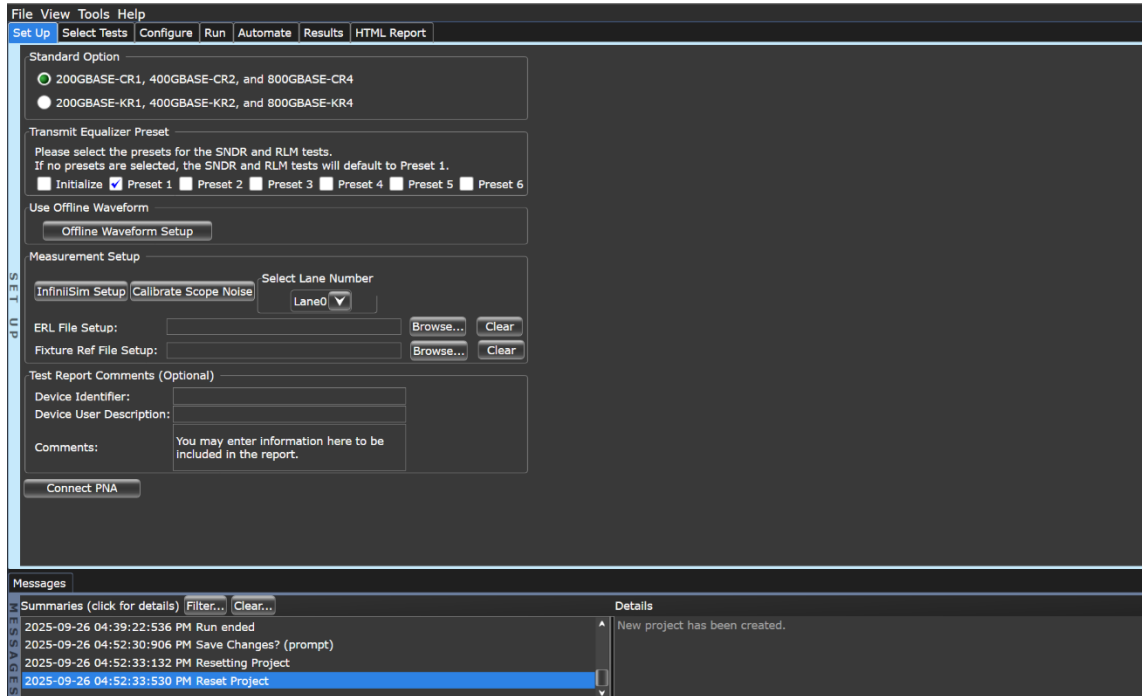


Figure 1. D90203UAC Initial setup and measurement groupings

Selecting Industry-Leading Hardware

The D90203UAC compliance application is optimized to leverage the high-speed signal acquisition, low jitter, and advanced equalization capabilities of the Infiniium UXR-Series real-time oscilloscopes. These instruments enable exceptional accuracy in timing, eye, and jitter-related measurements by combining precision PLLs, deep acquisition memory, and real-time signal processing.

UALink Tx compliance testing requires a well-defined low-pass filter response modeled as a 4th-order Bessel-Thomson (4BTR) filter at 60 GHz. To achieve accurate compliance with this specification, a UXR-Series oscilloscope with at least 90 GHz bandwidth is recommended. Higher-bandwidth models are digitally conditioned to match the 4BTR filter requirement, while lower-bandwidth models may still be used with increased measurement uncertainty.



Figure 2. Infiniium UXR-Series Real-Time Oscilloscopes

Recommended Oscilloscope

The D90203UAC solution requires a minimum instrument bandwidth of 59 GHz and will not operate on lower bandwidth instruments. The recommended instrument bandwidth configuration to support a 60 GHz 4th order Bessel Thomson filter response is 90 GHz, and it is under this condition that the highest precision results will be obtained.

Data Rate	Minimum Bandwidth (Brick Wall)	Minimum Channels	Compatible Real-Time Oscilloscopes
106.25 GBd PAM4	90 GHz	2	UXR

Example of Hardware Configuration

Model Number	Description	Quantity
UXR1104B UXR1102B UXR1004B UXR1002B UXR0804B UXR0802B UXR0704B UXR0702B UXR0594B UXR0592B UXR1104A UXR1102A UXR1004A UXR1002A UXR1102A UXR1104A	59-110 GHz Infiniium UXR-series oscilloscope Recommended 90 GHz systems	1

Ordering Information

Model Number	Description	Note
D90203UAC	UALink Transmitter compliance test application software	Required
D9320PAMA	Pulse Amplitude Modulation PAM-N analysis software	Required
D9320ASIA	Advanced signal integrity software (EQ, InfiniiSim advanced)	Required
D9320JITA	EZJIT complete - Jitter and vertical noise analysis software	Required

Select the Desired Software Test Suite

The D90203UAC UALink TX test application covers PAM4 transmitter measurements as specified in the IEEE P802.3dj specifications. The tests are organized conveniently by clause. Simply click on the desired test group to see the corresponding tests available under Select Tests (factory-installed options are shown).

The D90203UAC application includes most TX tests listed in the tables below. For a comprehensive and up-to-date list of specific tests supported, download the D90203UAC application from www.keysight.com, install it on an Infiniium UXR-Series oscilloscope, and run the application in time trial mode.

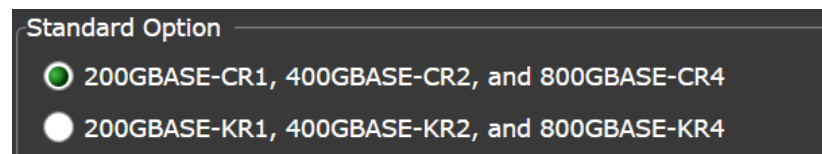


Figure 3. Choose the Standard Option you wish to test in the D90203UAC UALinkTX test application

The D90203UAC test application covers most TX tests outlined in the tables below. For a comprehensive and up-to-date list of specific tests covered by the application, download the D9020224C application from www.keysight.com, install it on an Infiniium UXR-Series oscilloscope, and run the application in time trial mode.

IEEE Reference	Description
Clause 178	200GBASE-KR1, 400GBASE-KR2, 800GBASE-KR4 and 1.6TBASE-KR8 KR transmitter characteristics
Clause 179	200GBASE-CR1, 400GBASE-CR2, 800GBASE-CR4 and 1.6TBASE-CR8 CR transmitter characteristics

Configure Your Measurements

The D90203UAC UALink TX test application offers flexibility in your test setup. It allows you to define controls for critical test parameters such as signaling rate, clock recovery used for analysis, and customizable violation settings. Once configured, the connection page displays the connection diagram for the selected test. The compliance application also provides hookup diagrams to guide you through any required connection changes based on the tests you select.

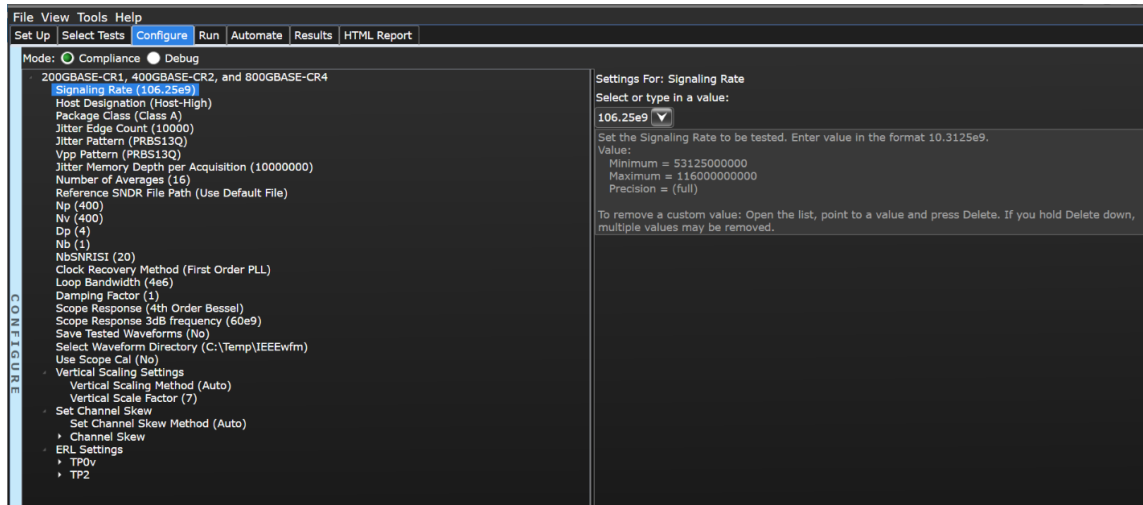


Figure 4. Configuration tab of D90203UAC UALinkTX test application

Choose Your Tests

The D90203UAC UALink TX test application provides comprehensive coverage of most PAM4 tests specific to the clause you are testing. You can select to run all available tests, a group of tests, or individual tests. The full test name appears in the test list as well as in the test results and reports. Each test includes a description and a reference to the relevant Standard.

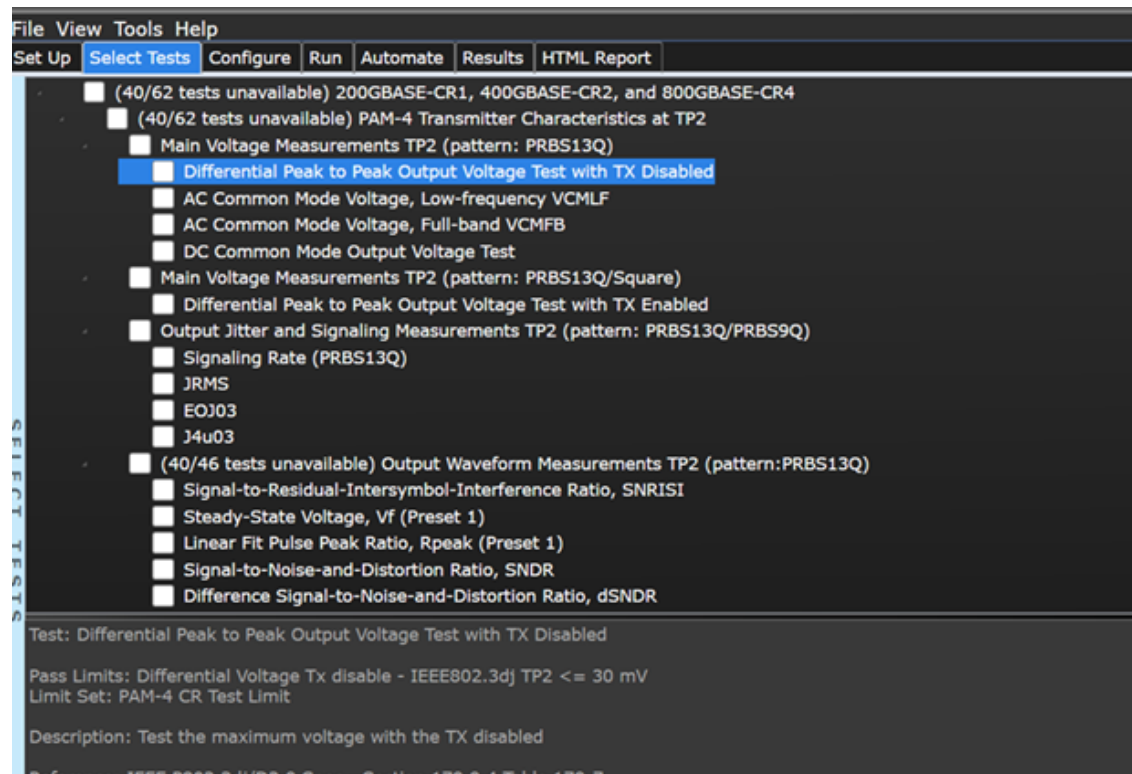


Figure 5. Available tests of D90203UAC TX test application

More Features Streamline Development

Generate Reports

Your team members and your customers are interested in the performance of your device. Share a test results report with them that shows the test conditions, summary of pass/fail, summary of all tests, and details for each test. Many include a test-specific screen shot of the measured parameter.

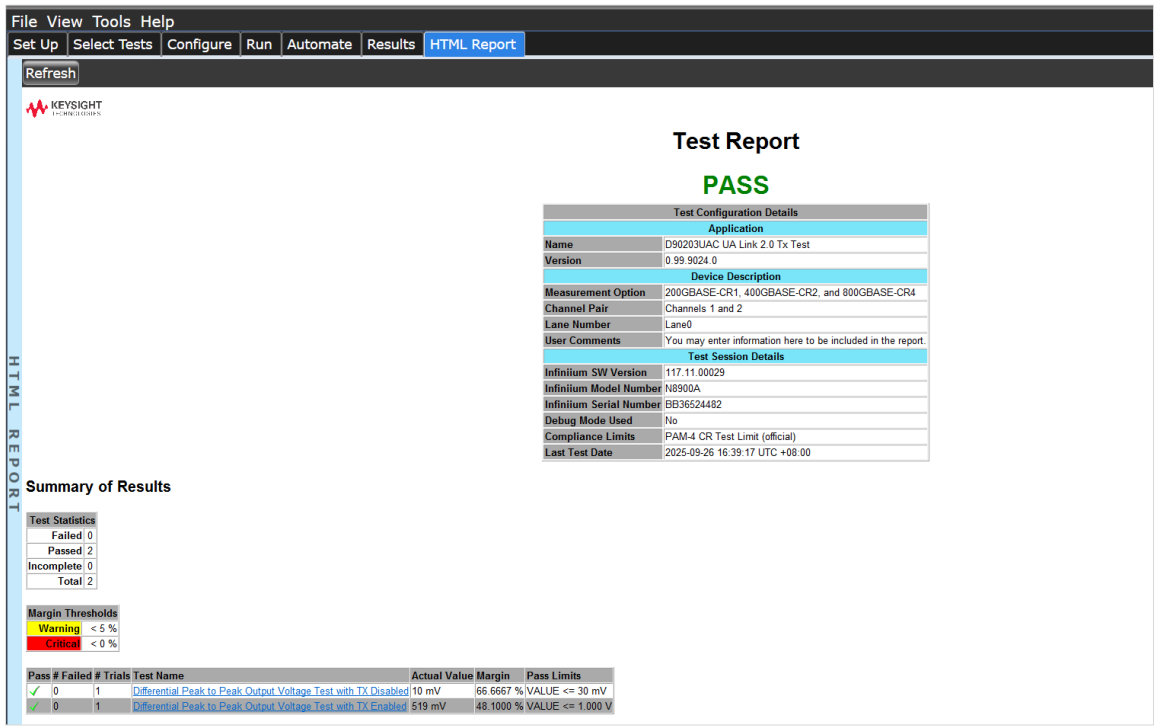


Figure 6. Test report and details

Control Your Device or Other Equipment

The Automation tab enables you to enter commands to control external devices or equipment, and to further sequence your tests or to control timing.

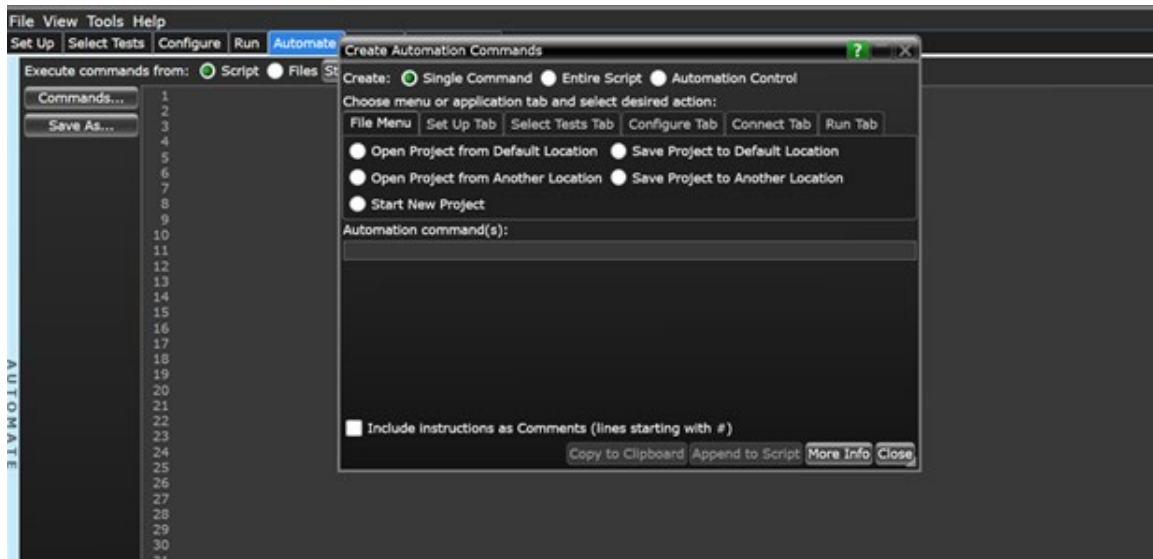


Figure 7. Automation commands in D90203UAC UALink TX test application

User-Defined Test Limit Editor

The Editable Test Limit feature allows users to define and adjust pass/fail criteria according to their specific requirements. Instead of relying on fixed thresholds, users can customize the acceptable range of test values directly within the application.

Create/Edit User-Defined Limit Set

1. Load Template Template: PAM-4 CR Test Limit (official)

2. Edit summary: Name: My PAM-4 CR Test Limit
Shared reference:

3. Select test limit(s)

Test Name	Limits
Signaling Rate (PRBS13Q)	%EV:SignalingRateMin% <= Value <= %EV:SignalingRateMax%
JRMS	Value <= 0.023
EOJ03	Value <= 0.025
J4u03	Value <= %EV:J4u03Max%
Level - PRBS pattern	Information Only
Level RMS - PRBS pattern	Information Only
Level Separation Mismatch Ratio - RLM	0.95 <= Value
Steady-State Voltage, Vf (Preset 1)	0.4 <= Value <= 0.5
Linear Fit Pulse Peak Ratio, Rpeak (Preset 1)	%EV:RpeakMin% <= Value
Signal-to-Noise-and-Distortion Ratio, SNDR	Information Only
Difference Signal-to-Noise-and-Distortion Ratio, dSNDR	0 <= Value
Signal-to-Residual-Intersymbol-Interference Ratio, SNRISI	26.7 <= Value
ERL	7.3 <= Value
abs Step Size for c(-3)	0.005 <= Value <= 0.025
abs Step Size for c(-2)	0.005 <= Value <= 0.025
abs Step Size for c(-1)	0.005 <= Value <= 0.025

Name: Signaling Rate (PRBS13Q)
Description: Signaling rate of the signal

4. Click action to perform:
Edit Combine Split

Output Full Path:

Save Save As Close

Figure 8. User-defined limits editor

Infiniium UXR-Series Oscilloscope Firmware Version Dependencies

Refer to the software release notes for the minimum required Infiniium UXR-Series firmware version to run the D90203UAC UALink TX test application.

Ordering Information

The D90203UAC UALink TX test application may be ordered and user installed into existing licensed Infiniium UXR-Series Real-Time Oscilloscopes or ordered with factory installation with a new instrument purchase.

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.

Time-based – Time-based 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.

Time-based licenses include a software support subscription through the term of the license.

Selecting Your License

Step 1. Choose your software product (eg. S1234567A).

Step 2. Choose your license term: perpetual or time-based.

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.

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 escalations when you need support.
- For more information, visit: KeysightCare Software Support Subscriptions, [5992-3419EN](tel:5992-3419EN)

Keysight enables innovators to push the boundaries of engineering by quickly solving design, emulation, and test challenges to create the best product experiences. Start your innovation journey at www.keysight.com.



This information is subject to change without notice. © Keysight Technologies, 2025 - 2026, Published in USA, May 29, 2026, 3125-1416.EN