

# D9010EAPC 10GBASE-KR Compliance Test Application Software

The Keysight Technologies, Inc. D9010EAPC 10GBASE-KR Ethernet backplane compliance test application software for Infiniium oscilloscopes provides you with an easy and accurate way to verify and debug your 10GBASE-KR and 40GBASE-KR4 Ethernet backplane designs. The Ethernet electrical test software allows you to automatically execute Ethernet physical-layer (PHY) electrical tests and displays the results in a flexible report format. In addition to the measurement data, the report provides a margin analysis that shows how closely your device passed or failed each test. The D9010EAPC 10GBASE-KR Ethernet backplane compliance test application software performs a wide range of electrical tests required to meet the 10GBASE-KR Ethernet backplane electrical specifications as documented in the IEEE 802.3ap standard. To meet signal quality requirements, your product must successfully pass conformance testing based on these specifications. Performing these tests gives you confidence in your design. The D9010EAPC 10GBASE-KR Ethernet backplane electrical test software helps you execute a wide subset of the conformance tests that can be measured with an oscilloscope.



## Transform complexity into simplicity

The D9010EAPC 10GBASE-KR Ethernet backplane electrical test software offers several features to simplify the validation of Ethernet designs:

- Setup wizard for quick and clear setup, configuration and test
- Wide range of 10GBASE-KR Ethernet backplane electrical tests for standards conformance
- Accurate and repeatable results with Keysight Infiniium oscilloscopes
- Automated reporting in a comprehensive HTML format with margin analysis

With the D9010EAPC 10GBASE-KR Ethernet electrical test software, you can use the same oscilloscope you use for everyday debugging to perform automated testing and margin analysis based on the IEEE802.3-2018 standard.

## D9010EAPC 10GBASE-KR Application Software Saves You Time

The D9010EAPC 10GBASE-KR Ethernet electrical compliance test application software saves you time by setting the stage for automatic execution of 10GBASE-KR electrical tests. Part of the difficulty of performing electrical tests for Ethernet transmitters is properly connecting to the oscilloscope, loading the proper setup files, and then analyzing the measured results by comparing them to limits published in the specification. The Ethernet electrical compliance test application software does much of this work for you. The 10GBASE-KR Ethernet electrical compliance test application software automatically configures the oscilloscope for each test, and it provides an informative results report that includes margin analysis indicating how close your product is to passing or failing that specification.

## Easy test definition

The D9010EAPC 10GBASE-KR Ethernet electrical compliance test application software extends the ease-of-use advantages of Keysight's Infiniium oscilloscopes to testing 10GBASE-KR designs. The Keysight automated test engine walks you quickly through the steps required to define the tests you want to make, set up the tests, perform the tests, and view the test results. A setup page enables you to quickly make decisions from the outset regarding the choice of tests and perform functions that affect the testing task. The test selections available in the following steps are then filtered according to the choices made in the setup page. While selecting tests, you can select a category of tests all at once or specify individual tests. You can save tests and configurations as project files and recall them later for quick testing and review of previous test results. Straightforward menus let you perform tests with a minimum of mouse clicks.

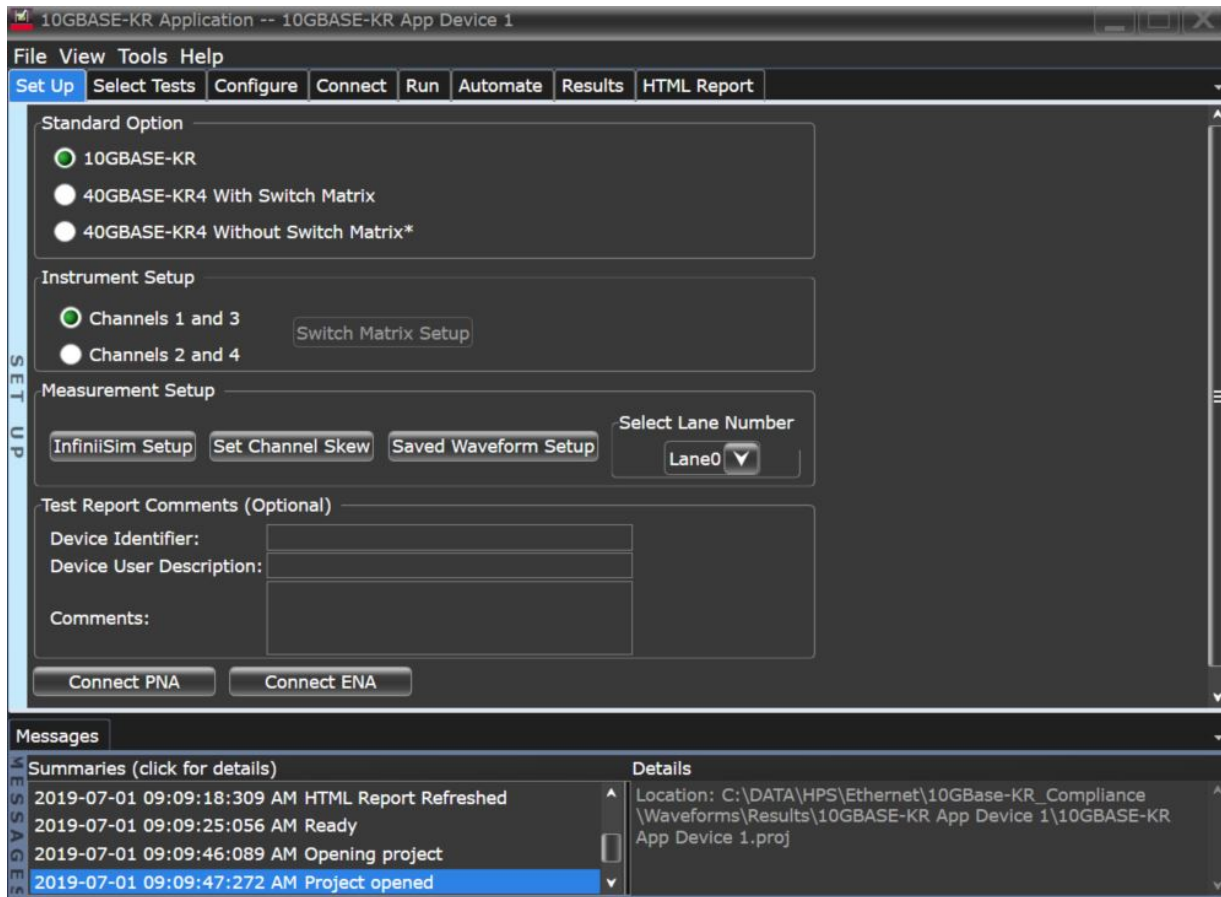


Figure 1. The clean interface of the setup page enables you to quickly make decisions and perform functions that affect the testing task.

## Compliance Measurement Tests

The D9010EAPC 10GBASE-KR compliance test application allows you to run single or multiple tests based on your needs. Highlight a test to show more details including tests limits and references to related details of the specification. Accurate and repeatable results give you confidence in your measurements.

You can also specify the number of test trials and only stop running selected tests when the stop condition is met. The application will save the worst-case test result to help you track down the anomalies in your signals.

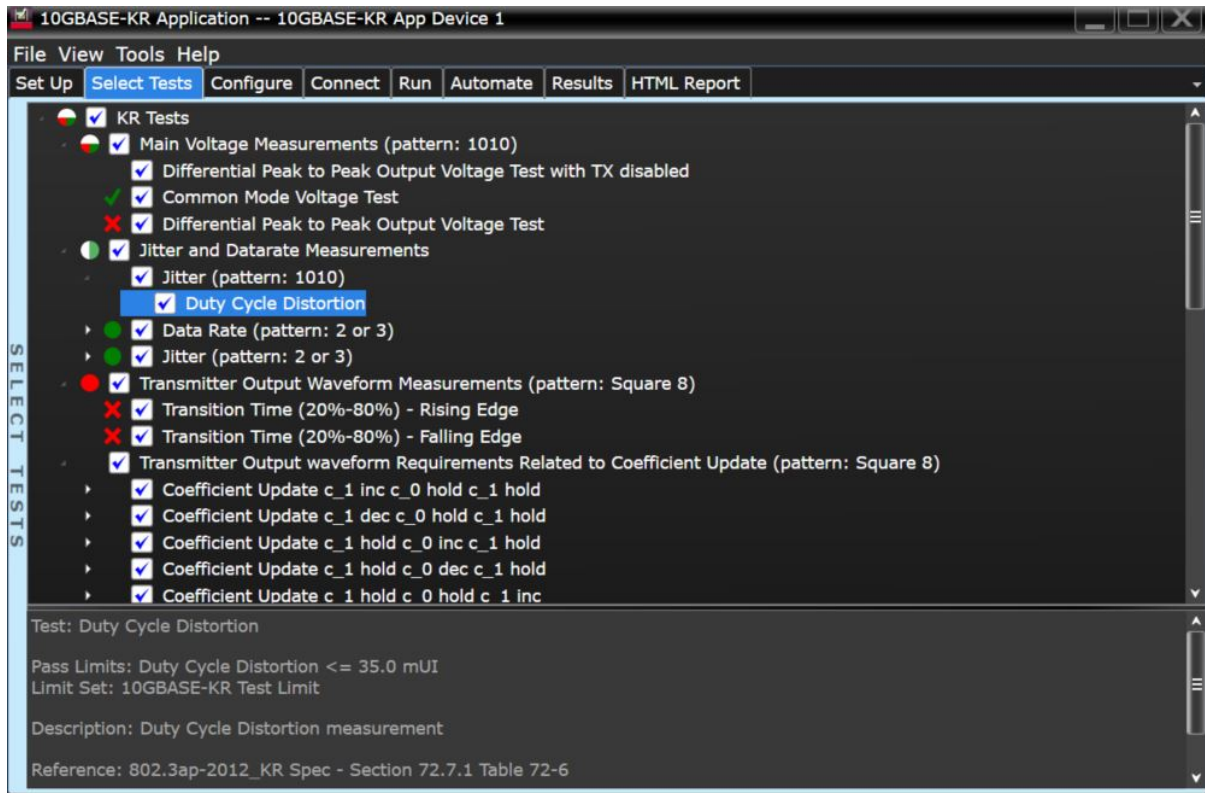


Figure 2. The Keysight automated test engine quickly guides you through selecting and configuring tests, setting up the connection, running the tests, and viewing the results. You can easily select individual tests or groups of tests with a mouse-click.

## Configurability and Guided Connection

The D9010EAPC 10GBASE-KR compliance test application provides flexibility in your test setup. The application lets you define controls for critical test parameters such as voltage threshold values, number of waveforms used for analysis and customizable violation settings. Once you have configured the tests, the connection page will display the connection diagram for the test you have selected. The compliance application guides you to make connection changes with hookup diagrams when the tests you select require it.

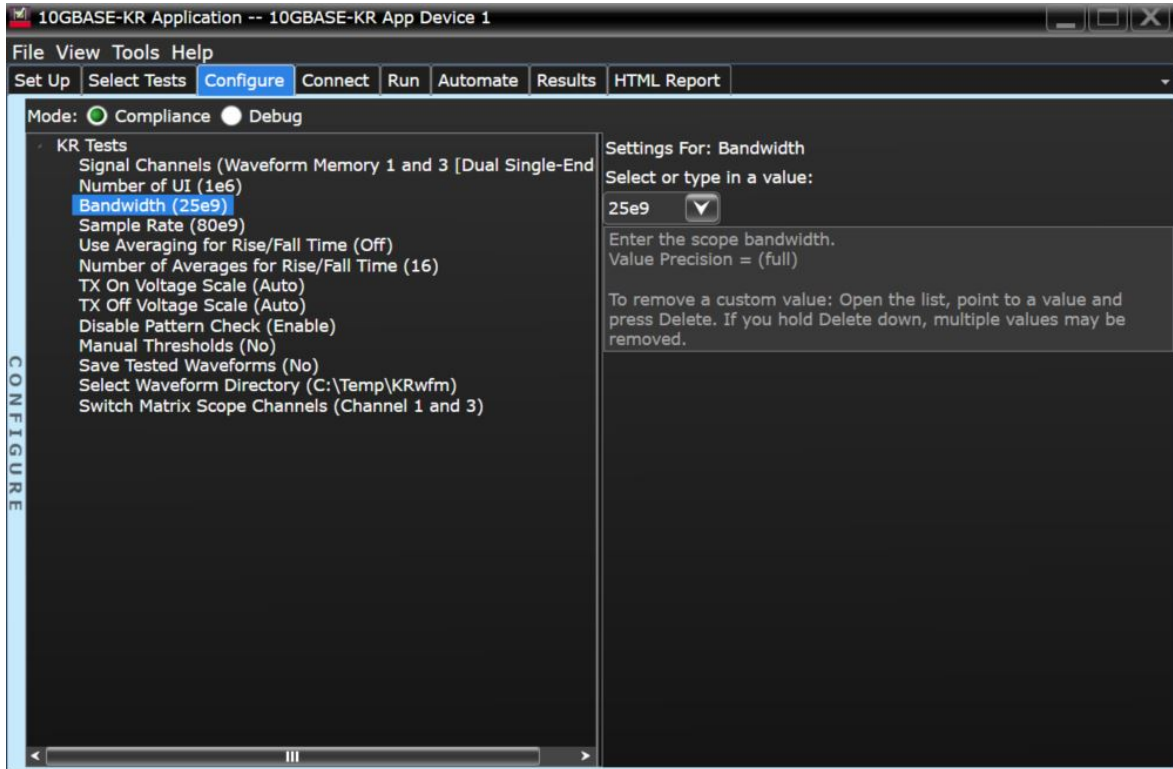


Figure 3. To set up tests, you define the device to test, its configuration, and how the oscilloscope is connected to it.

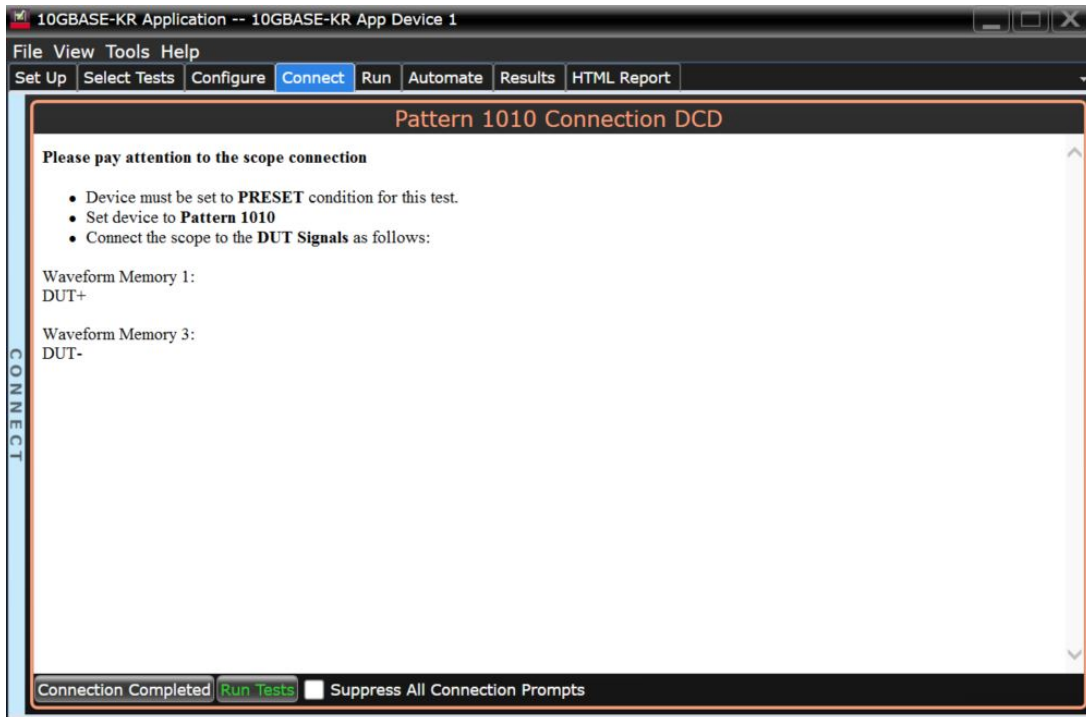


Figure 4. When you make multiple tests where the connections must be changed, the software prompts you with connection diagrams.

## Comprehensive Result Analysis

In addition to providing you with measurement results, the D9010EAPC 10GBASE-KR compliance test application software provides a report format that shows you not only where your product passes or fails, but also reports how close you are to the limits specified for a test. You can select the margin test report parameter, which means you can specify the level at which warnings are issued to alert you to electrical tests where your product is operating close to the official test limit defined by the 10GBASE-KR specification.

### Test Report

Overall Result: **FAIL**

Test Configuration Details	
Device Description	
Speed Grade	10GBASE-KR
Test Session Details	
Infinium SW Version	06.20.00620
Infinium Model Number	N8900A
Infinium Serial Number	No Serial
Application SW Version	2.02.0001
Debug Mode Used	No
Compliance Limits (official)	10GBASE-KR Test Limit
Last Test Date	2018-05-04 11:16:41 UTC -06:00

### Summary of Results

Test Statistics	
Failed	11
Passed	22
Total	33

Margin Thresholds	
Warning	< 2 %
Critical	< 0 %

Pass #	Failed	# Trials	Test Name	Worst Actual	Worst Margin	Pass Limits
✓	0	2	Random Jitter	76.0 mUI	49.3 %	VALUE <= 150.0 mUI
✓	0	2	Deterministic Jitter	62.2 mUI	58.5 %	VALUE <= 150.0 mUI
✓	0	2	Total Jitter	138.6 mUI	50.5 %	VALUE <= 280.0 mUI
✓	0	1	Data Rate Mean	10.312501082 Gbps	49.9 %	10.311468750 Gbps <= VALUE <= 10.313531250 Gbps
✓	0	1	Common Mode Voltage Test	265.89 mv	14.0 %	0.00000 v <= VALUE <= 1.90000 v
✗	1	1	Differential Peak to Peak Output Voltage Test	1.631 v	35.9 %	VALUE <= 1.200 v
✗	1	1	Transition Time (20%-80%) - Rising Edge	14.360 ps	41.9 %	24.000 ps <= VALUE <= 47.000 ps
✗	1	1	Transition Time (20%-80%) - Falling Edge	14.480 ps	41.4 %	24.000 ps <= VALUE <= 47.000 ps
✓	0	1	Rpre - Coefficient Status dis-min-dis	1.058	21.0 %	900 m <= VALUE <= 1.100
✓	0	1	Rpst - Coefficient Status dis-min-dis	1.064	18.0 %	900 m <= VALUE <= 1.100
✓	0	1	v2 - Coefficient Status dis-min-dis	744 mv	176E+01 %	VALUE >= 40 mv
✗	1	1	delta_v2 (Additional) - Coefficient Status dis-min-dis	74 mv	35.9 %	VALUE <= 40 mv
✗	1	1	delta_v5 (Additional) - Coefficient Status dis-min-dis	74 mv	35.9 %	VALUE <= 40 mv
✓	0	1	v(1+v1)v1 (Additional) - Coefficient Status dis-min-dis	-29 m	158.0 %	VALUE <= 50 m
✓	0	1	v(2+v5)v2 (Additional) - Coefficient Status dis-min-dis	-22 m	144.0 %	VALUE <= 50 m
✓	0	1	v(3+v6)v3 (Additional) - Coefficient Status dis-min-dis	-9 m	118.0 %	VALUE <= 50 m

Figure 5. The D9010EAPC 10GBASE-KR compliance test application software results screen shows a summary of the tests performed, pass/fail status, and margin. Clicking on a specific test also shows the test specification and a measurement waveform, if appropriate.

## Thorough Performance Reporting

The D9010EAPC 10GBASE-KR compliance test application software generates HTML reports that captures the performance, status and margins of your device under test. It also captures screenshots of critical measurements of your reference and documentation. This report is suitable for printing and sharing with your test vendors, customers and suppliers.

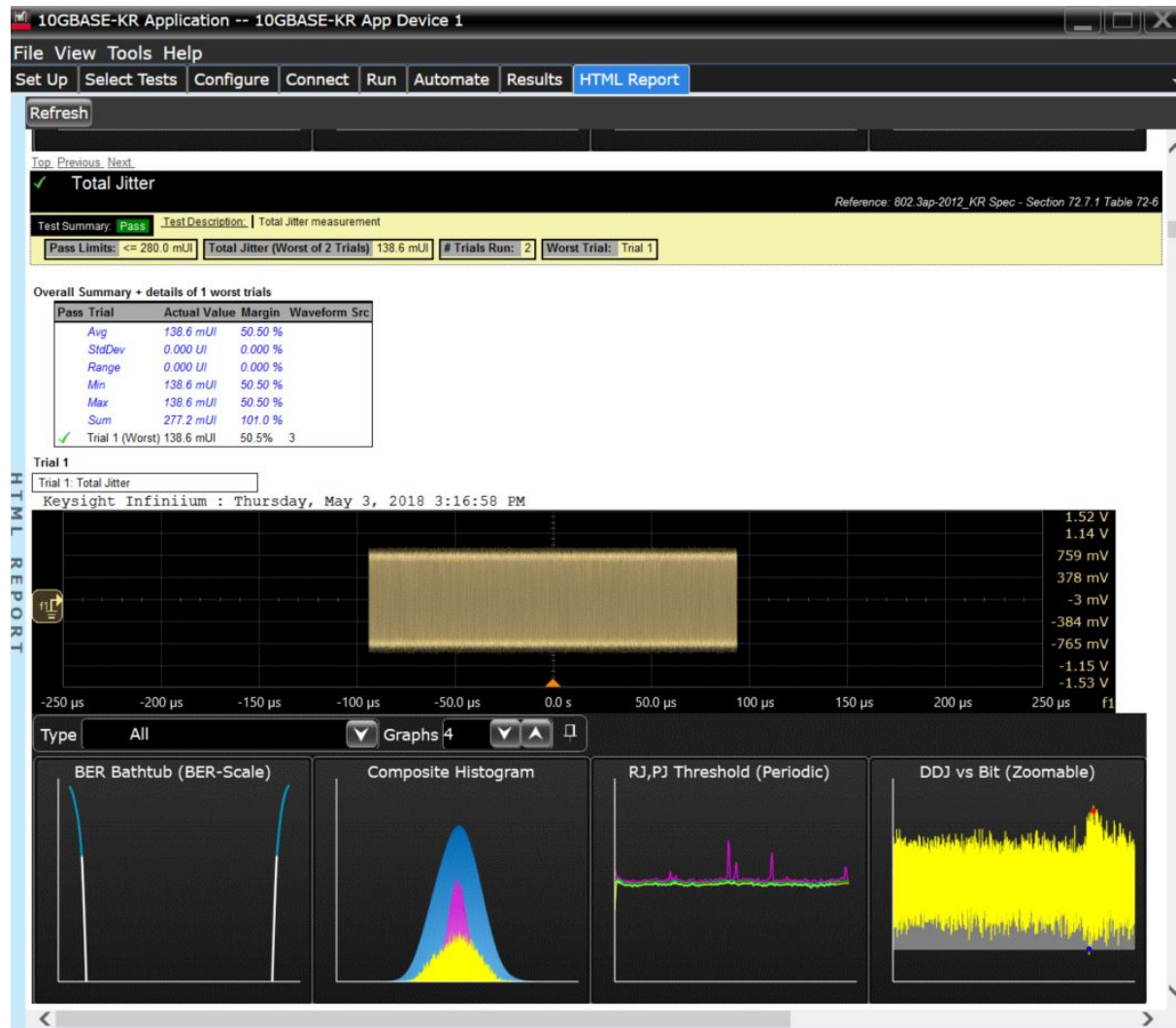


Figure 6. Additional details are available for each test, including the test limits, test description, and test results, including waveforms, if appropriate.

## Recommended Oscilloscope

The D9010EAPC 10GBASE-KR Compliance Test Application Software is compatible with Keysight Infiniium Series oscilloscopes with operating software revision 6.30 or higher.

Data Rates	Minimum Bandwidth	Minimum Channels	Compatible Oscilloscopes
10 Gbps 40 Gbps (4 x 10)	25 GHz	4	V-Series, Z-Series and UXR

## Software Ordering Information

Model number	Description	Note
D9010EAPC	10GBASE-KR Compliance Test Application Software	Required
D9020ASIA	Advanced Signal Integrity Software (EQ, InfiniiSim Advanced)	Required
D9020JITA	EZJIT Complete - Jitter and Vertical Noise Analysis Software	Required

## Example of Hardware Configuration

Model number	Description	Quantity
UXR0254A	25 GHz Infiniium UXR-series oscilloscope	1



## 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 (e.g. 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.

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