D9010BJBC 100GBASE-KR4 Test Application

KEYSIGHT

METHODS OF IMPLEMENTATION

Notices

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Contents

1 Overview

100GBASE-KR4 Automated Testing–At a Glance / 8

Required Equipment and Software / 9

Hardware / 9

Software / 9

Licensing information / 9

2 Installing the Test Application and Licenses

Installing the Test Application / 12

Installing the License Key / 13

Using Keysight License Manager 5 / 13

Using Keysight License Manager 6 / 14

3 Preparing to Take Measurements

Calibrating the Oscilloscope / 18

Starting the 100GBASE-KR4 Test Application / 19

Configuring 100GBASE-KR4 Test Application for test runs / 24

Configuring Switch Matrix / 28

Overview / 28

Enabling Switch Matrix / 28

Establishing Connection to the Switch Drivers / 29

Configuring Signal Paths / 35

Configuring Signal Paths with Automatic Selection / 36

Configuring Signal Paths with Manual Selection / 36

Response Correction / 37

4 Main Voltage Measurements

Differential Peak to Peak Output Voltage Test with TX Disabled / 41

DC Common Mode Output Voltage Test / 42

AC Common Mode Output Voltage Test / 43

Differential Peak to Peak Output Voltage Test / 44

5 Jitter and Signaling Rate Measurements

Signaling Rate / 47

Jitter (Even-Odd Jitter, Bounded Uncorrelated Jitter, Total Uncorrelated Jitter) / 48

6 Output Waveform Measurements

Steady State Voltage Vf / 51

Linear Fit Pulse Peak / 52

Signal-to-noise-and-distortion ratio / 53

7 Normalized Coefficient Step Size Measurements

abs Coefficient Step Size c(1) inc c(0)hold c(-1)hold / 57

abs Coefficient Step Size c(1)dec c(0)hold c(-1)hold / 58

abs Coefficient Step Size c(1)hold c(0)inc c(-1)hold / 59

abs Coefficient Step Size c(1)hold c(0)dec c(-1)hold / 60

abs Coefficient Step Size c(1)hold c(0)hold c(-1)inc / 61

abs Coefficient Step Size c(1)hold c(0)hold c(-1)dec / 62

8 Full Scale Range Tests

Minimum Pre-cursor Full-scale Test / 65

Minimum Post-cursor Full-scale Test / 66

9 Return Loss PNA/ENA Measurements

10 DME/EEE Waveform Measurements

DME Differential Peak-to-Peak Output Voltage Test / 71

DME T1-Transition Position Spacing (Period) Test / 72

DME T2-Clock Transition to Clock Transition Test / 73

DME T3-Clock Transition to Data Transition Test / 74

EEE Differential Peak-to-Peak Output Voltage Test with TX Disabled / 75

EEE Differential Peak-to-Peak Output Voltage Test / 76

EEE Common Mode Deviation Voltage Test / 77

11 Exporting Measurement Results to Repository

Uploading Results to Repository / 80

KS6800A Series Analytics Service Software / 88

12 Debug Mode

Index

1 Overview

100GBASE-KR4 Automated Testing—At a Glance 8
Required Equipment and Software 9

100GBASE-KR4 Automated Testing—At a Glance

The Keysight D9010BJBC 100GBASE-KR4 Test Application is an Ethernet test solution that covers the electrical timing parameters for 100GBASE-KR4 specification (IEEE 802.3bj D3p2).

The Keysight D9010BJBC 100GBASE-KR4 Test Application:

- Lets you select individual or multiple tests to run.
- Lets you identify the device being tested and its configuration.
- Shows you how to make oscilloscope connections to the device under test.
- Automatically checks for proper oscilloscope configuration.
- Automatically sets up the oscilloscope for each test.
- Provides detailed information for each test that has been run and lets you specify the thresholds at which marginal or critical warnings appear.
- Creates a printable HTML report of the tests that have been run.

NOTE

The tests performed by the Keysight D9010BJBC 100GBASE-KR4 Test Application are intended to provide a quick check of the electrical health of the DUT. This testing is not a replacement for an exhaustive test validation plan.

Required Equipment and Software

In order to run the 100GBASE-KR4 automated tests, you need the following equipment and software:

Hardware

- Use one of the following Oscilloscope models. Refer to www.keysight.com for the respective bandwidth ranges.
  - Keysight DSA-X / DSO-X 90000 Q-Series Oscilloscopes
  - Keysight UXR Oscilloscopes
- For differential probing (minimum 25GHz)

NOTE **These can be used as an option, but will be BW limited. Instead, it is recommended to test with cables on the Real Edge channels.**

  - N2802A 25 GHz InfiniiMax III Series probe amplifier
  - N2803A 30 GHz InfiniiMax III Series probe amplifier
  - N2836A InfiniiMax III 26 GHz solder-in probe head
- For single-ended probing
  - SMA cables that are able to support the 25 Gb speed
- Keyboard, qty = 1, (provided with the Keysight Infiniium oscilloscope)
- Mouse, qty = 1, (provided with the Keysight Infiniium oscilloscope)
- Keysight also recommends using a second monitor to view the test application.

Software

- The minimum version of Infiniium Oscilloscope Software (see the Keysight D9010BJBC 100GBASE-KR4 Test Application Release Notes)
- Keysight D9010BJBC 100GBASE-KR4 Test Application software

Licensing information

Refer to the *Data Sheet* pertaining to 100GBASE-KR4 Test Application to know about the licenses you must install along with other optional licenses. Visit "http://www.keysight.com/find/D9010BJBC" and in the web page's **Document Library** tab, you may view the associated Data Sheet.

To procure a license, you require the Host ID information that is displayed in the Keysight License Manager application installed on the same machine where you wish to install the license.

The licensing format for Keysight License Manager 6 differs from its predecessors. See "Installing the License Key" on page 13 to see the difference in installing a license key using either of the applications on your machine.

2 Installing the Test Application and Licenses

Installing the Test Application 12
Installing the License Key 13

If you purchased the D9010BJBC 100GBASE-KR4 Test Application separate from your Infiniium oscilloscope, you must install the software and license key.

Installing the Test Application

1. Make sure you have the minimum version of Infiniium Oscilloscope software (see the D9010BJBC release notes). To ensure that you have the minimum version, select **Help > About Infiniium...** from the main menu.
2. To obtain the 100GBASE-KR4 Test Application, go to Keysight website: "http://www.keysight.com/find/D9010BJBC".
3. In the web page's **Trials & Licenses** tab, click the **Details and Download** button to view instructions for downloading and installing the application software.

Installing the License Key

To procure a license, you require the Host ID information that is displayed in the Keysight License Manager application installed on the same machine where you wish to install the license.

Using Keysight License Manager 5

To view and copy the Host ID from Keysight License Manager 5:

1 Launch Keysight License Manager on your machine, where you wish to run the Test Application and its features.

2 Copy the Host ID that appears on the top pane of the application. Note that x indicates numeric values.

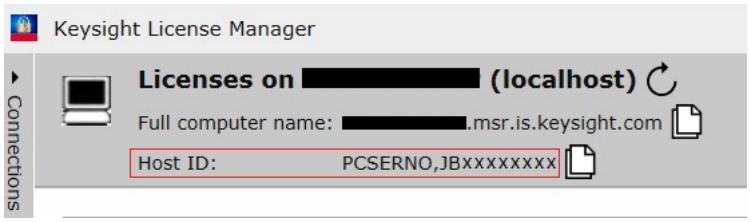


Figure 1 Viewing the Host ID information in Keysight License Manager 5

To install one of the procured licenses using Keysight License Manager 5 application,

1 Save the license files on the machine, where you wish to run the Test Application and its features.

2 Launch Keysight License Manager.

3 From the configuration menu, use one of the options to install each license file.

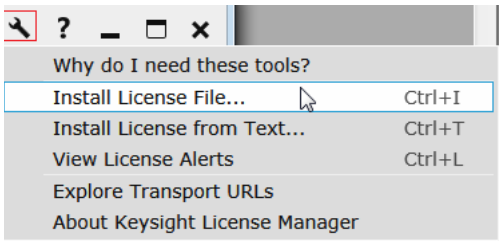


Figure 2 Configuration menu options to install licenses on Keysight License Manager 5

For more information regarding installation of procured licenses on Keysight License Manager 5, refer to Keysight License Manager 5 Supporting Documentation.

Using Keysight License Manager 6

To view and copy the Host ID from Keysight License Manager 6:

1 Launch Keysight License Manager 6 on your machine, where you wish to run the Test Application and its features.

2 Copy the Host ID, which is the first set of alphanumeric value (as highlighted in Figure 3) that appears in the Environment tab of the application. Note that x indicates numeric values.

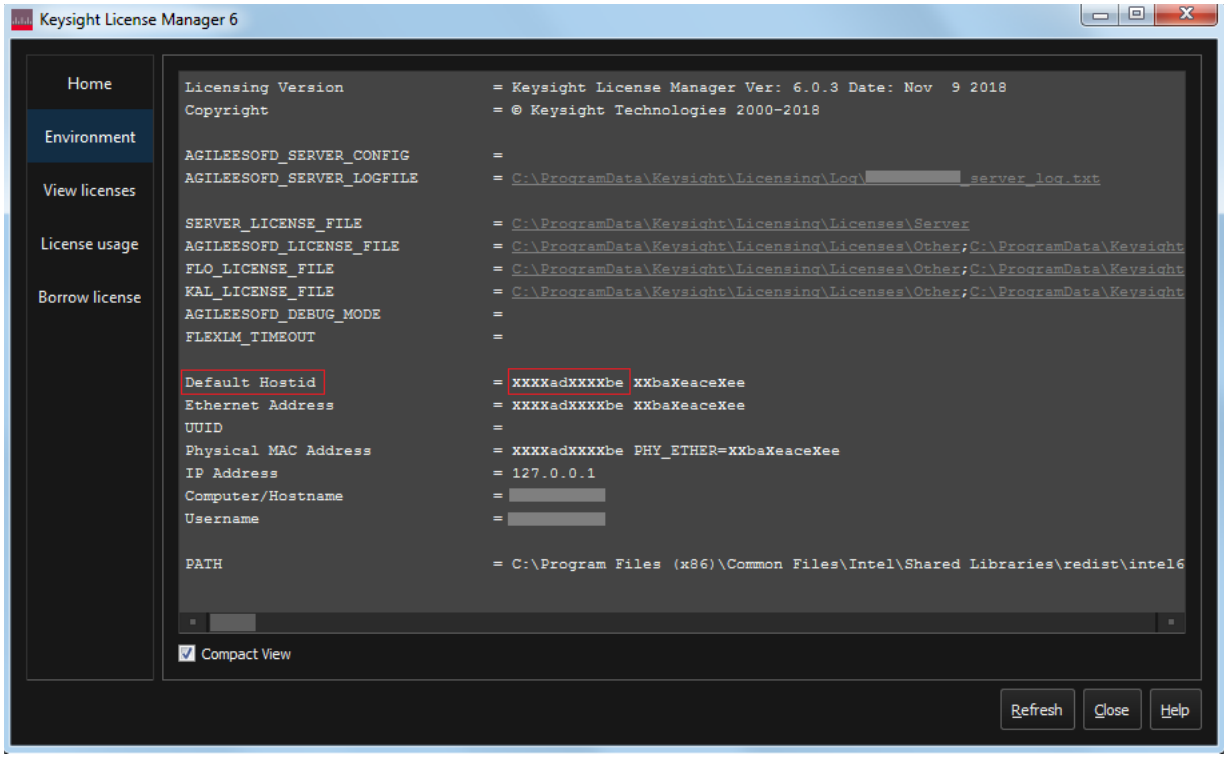


Figure 3 Viewing the Host ID information in Keysight License Manager 6

To install one of the procured licenses using Keysight License Manager 6 application,

1 Save the license files on the machine, where you wish to run the Test Application and its features.

2 Launch Keysight License Manager 6.

3 From the Home tab, use one of the options to install each license file.

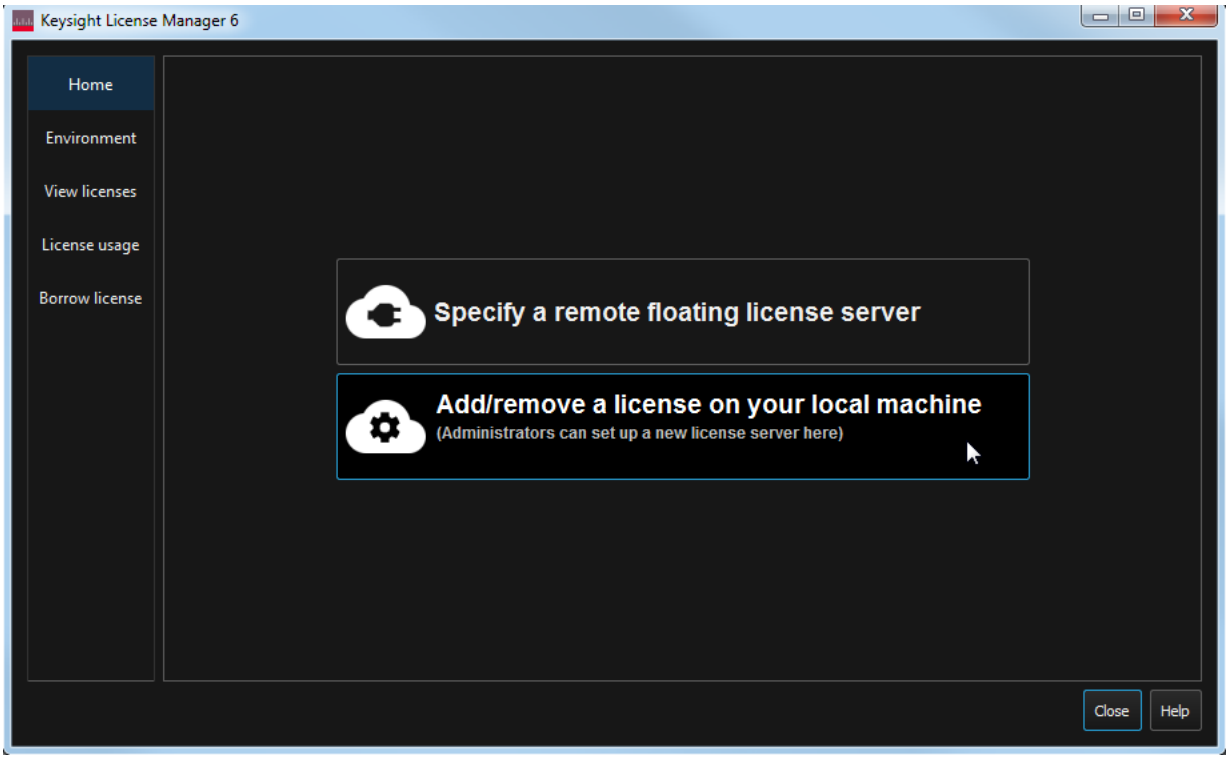


Figure 4 Home menu options to install licenses on Keysight License Manager 6

For more information regarding installation of procured licenses on Keysight License Manager 6, refer to Keysight License Manager 6 Supporting Documentation.

3 Preparing to Take Measurements

Calibrating the Oscilloscope 18
Starting the 100GBASE-KR4 Test Application 19
Configuring 100GBASE-KR4 Test Application for test runs 24
Configuring Switch Matrix 28

Before running the automated tests, you should calibrate the oscilloscope and probe. No test fixture is required for this application. After the oscilloscope and probe have been calibrated, you are ready to start the 100GBASE-KR4 Test Application and perform the measurements.

Calibrating the Oscilloscope

If you have not already calibrated the oscilloscope, refer to the *User Guide* for the respective Oscilloscope you are using.

NOTE If the ambient temperature changes more than 5 degrees Celsius from the calibration temperature, internal calibration should be performed again. The delta between the calibration temperature and the present operating temperature is shown in the **Utilities > Calibration** menu.

NOTE If you switch cables between channels or other Oscilloscopes, it is necessary to perform cable and probe calibration again. Keysight recommends that, once calibration is performed, you label the cables with the channel on which they were calibrated.

Starting the 100GBASE-KR4 Test Application

1 Ensure that the 100GBASE-KR4 or 25GBASE-KR Device Under Test (DUT) is operating and set to desired test modes.

2 To start the 100GBASE-KR4 Test Application: From the Infiniium Oscilloscope's main menu, select **Analyze > Automated Test Apps > D9010BJBC 100GBASE-KR4 Test App**.

- Figure 5 shows the Keysight D9010BJBC 100GBASE-KR4 Test Application window as it appears when launched within the Infiniium application of the DSO Q-Series Oscilloscope. The Instrument Setup area in the Set Up tab displays Real Edge, which indicates Channels 1R and 3R on the oscilloscope.

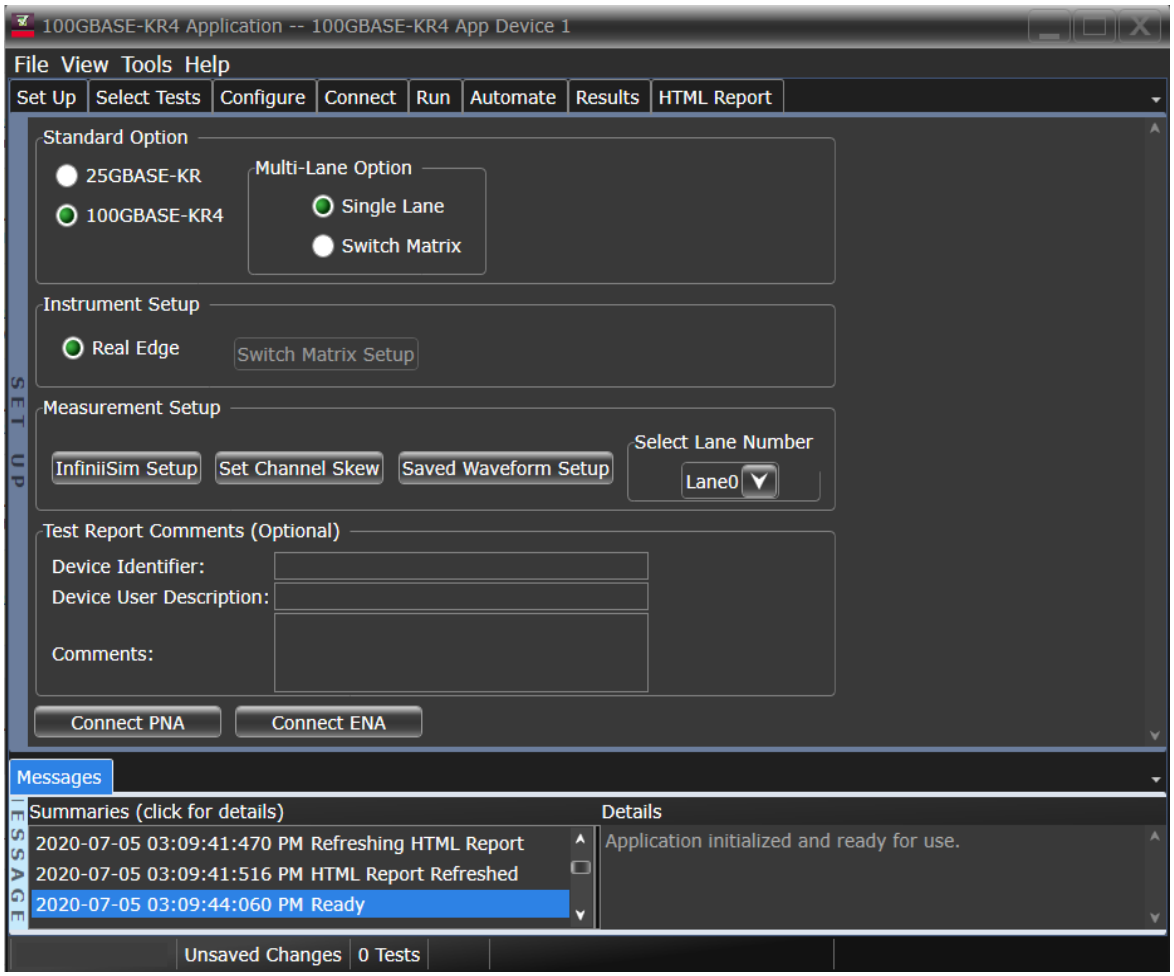


Figure 5 100GBASE-KR4 Test Application main window on a Z-Series DSO (100GBASE-KR4 option)

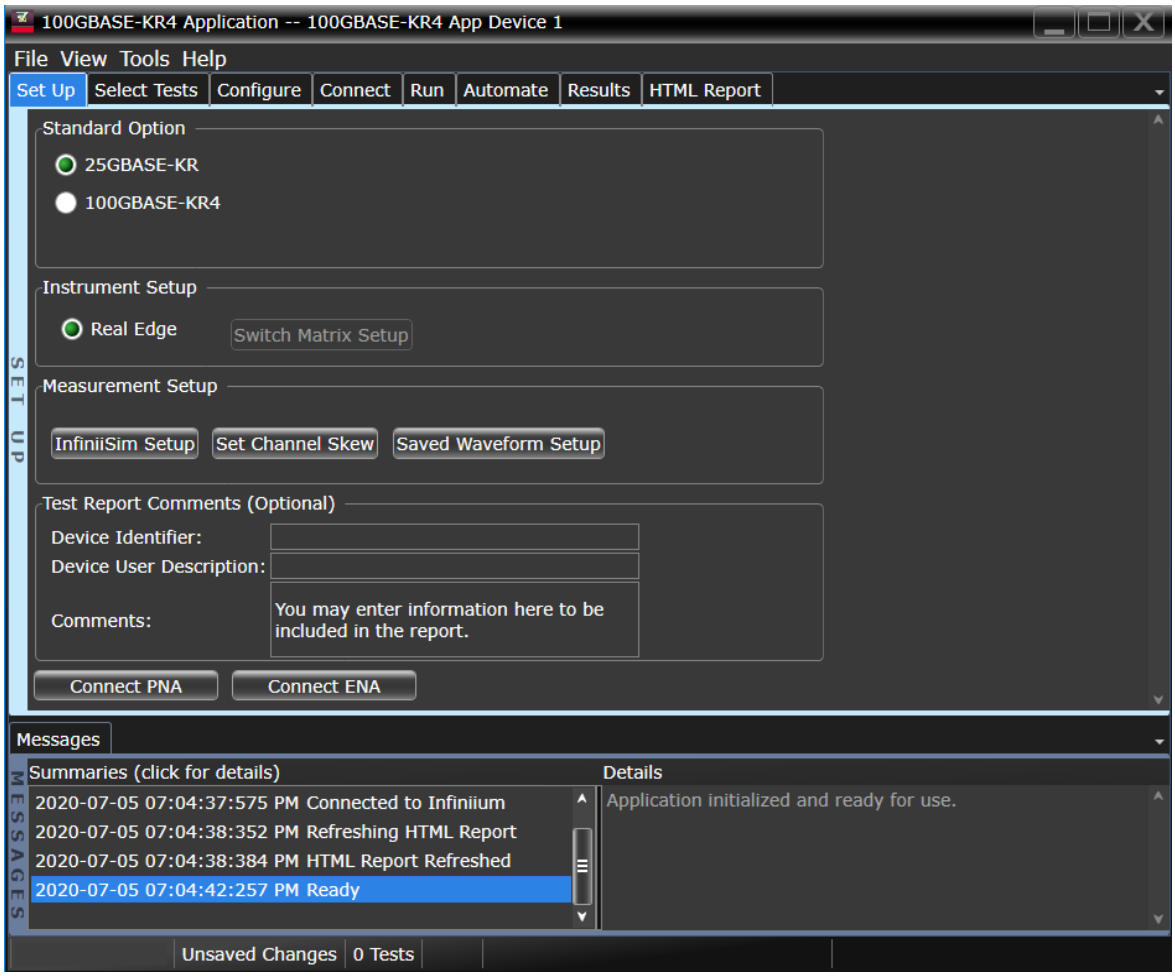


Figure 6 100GBASE-KR4 Test Application main window on a Z-Series DSO (25GBASE-KR option)

- Figure 7 shows the Keysight D9010BJBC 100GBASE-KR4 Test Application window as it appears when launched within the Infiniium application of the UXR Oscilloscope. The Instrument Setup area in the Set Up tab displays the corresponding Channel assignments.

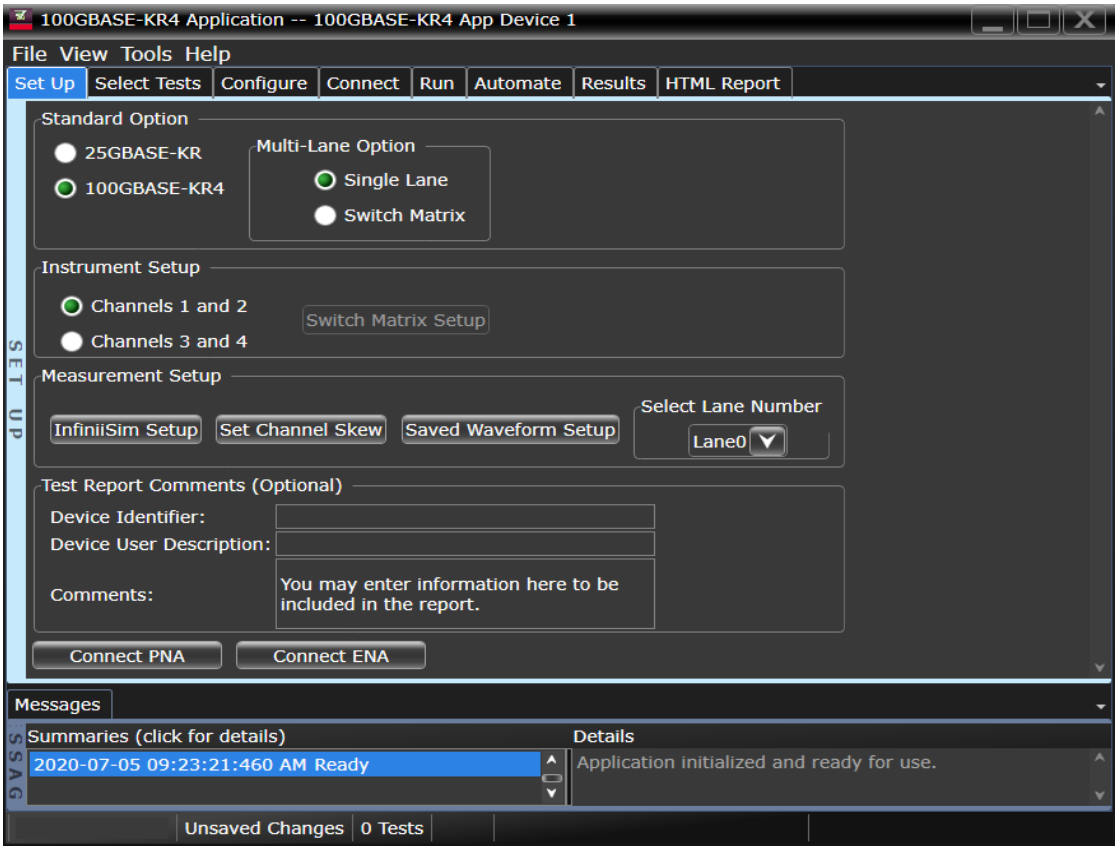


Figure 7 100GBASE-KR4 Test Application main window on a UXR Oscilloscope (100GBASE-KR4 option)

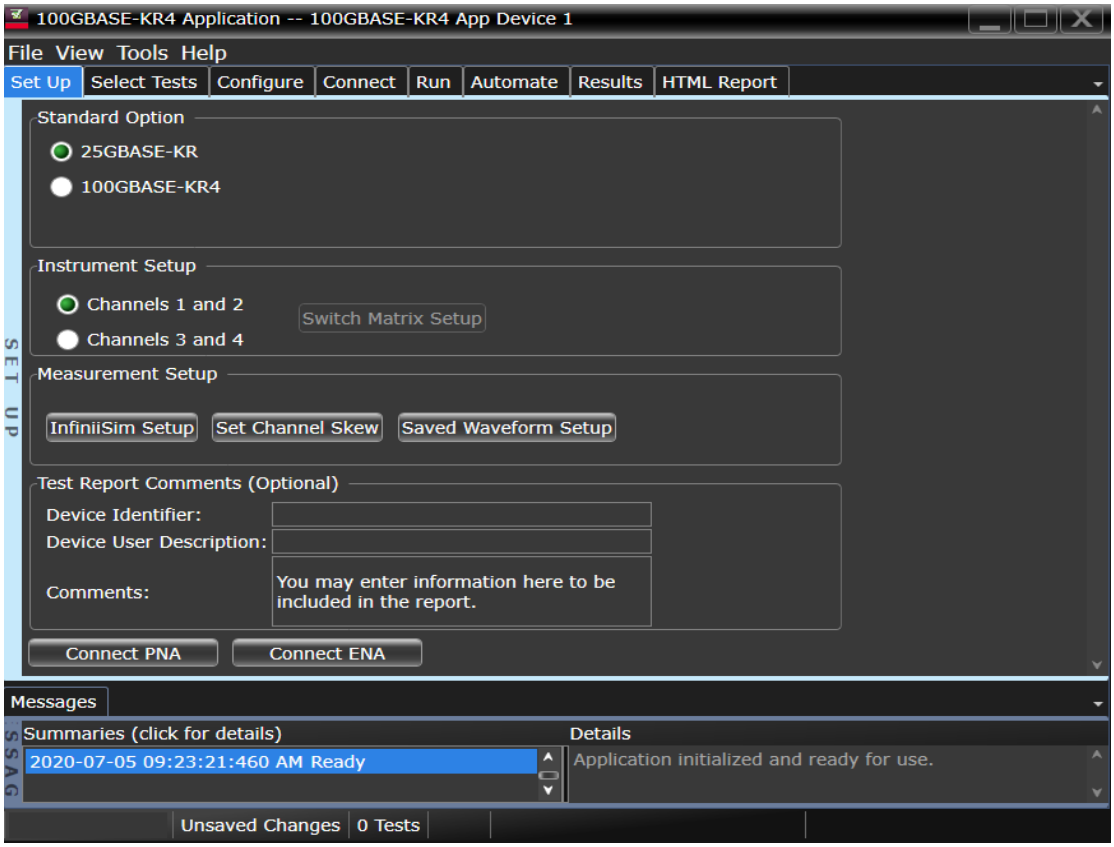


Figure 8 100GBASE-KR4 Test Application main window on a UXR Oscilloscope (25GBASE-KR option)

The task flow pane and the tabs in the main pane show the steps you take in running the automated tests:

Set Up	Lets you identify and set up the test environment, including information about the device under test. The **Device Identifier**, **User Description**, and **Comments** are all printed in the final HTML report. Select the **Standard Option** and **SignalType** to be tested. For UXR scopes, select the appropriate Channel option in **Instrument Setup**. Set up InfiniiSim with the **InfiniiSim Setup** button. With the **Set Channel Skew** button, the channels can be visually adjusted and skewed. The **Saved Waveform Setup** button enables easy setup of saved waveforms. When waveforms are set up, the application makes all measurements on the saved waveforms. The **Select Lane Number** enables you to choose to test a single lane or with the switch matrix.
Select Tests	Lets you select the tests you want to run. The tests are organized hierarchically so you can select all tests in a group. After tests are run, status indicators show which tests have passed, failed, or not been run, and there are indicators for the test groups.
Configure	Lets you configure test parameters (for example, channels used in test, voltage levels, etc.).
Connect	Shows you how to connect the oscilloscope to the device under test for the tests that are to be run.
Run	Starts the automated tests. If the connections to the device under test need to be changed while multiple tests are running, the tests pause, show you how to change the connection, and wait for you to confirm that the connections have been changed before continuing.
Automate	Lets you construct scripts of commands that drive execution of the application.
Results	Contains more detailed information about the tests that have been run. You can change the thresholds at which marginal or critical warnings appear.
HTML Report	Shows a compliance test report that can be printed.

NOTE

In the **Configure** tab, the values for all such Configuration parameters that are Oscilloscope-dependent, will correspond to the Oscilloscope Model (DSOs or UXRs), where you are running the Test Application.

Configuring 100GBASE-KR4 Test Application for test runs

To run one or more compliance tests on the DUT, which is connected to Oscilloscope, proceed to configure the 100GBASE-KR4 Test Application:

1 In the **Set Up** tab (shown in Figure 5 and Figure 7), select a **Multi-Lane Option** to determine the lane where the tests must be performed for the 100GBASE-KR4 standard.

If Switch Matrix is selected in the Multi-Lane Option, click Switch Matrix Setup to configure the Switch Matrix in the Test App. Refer to "Configuring Switch Matrix" on page 28 for more details.

2 In the **Select Tests** tab, select one or more tests.

3 In the **Configure** tab, you may change the values assigned to one or more options to cater to the compliance requirements for the selected tests. By default, the 100GBASE-KR4 Test Application sets optimum values for each configuration parameter.

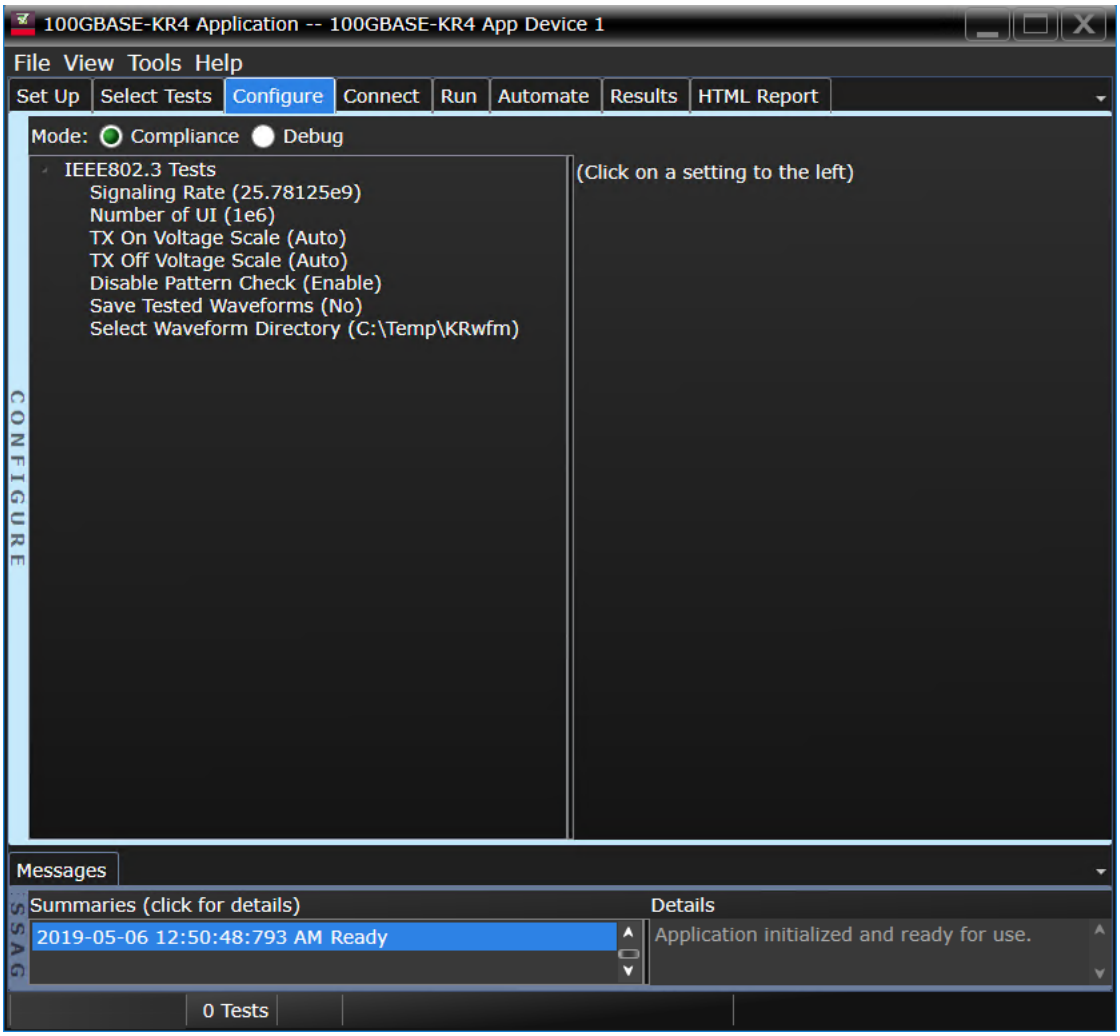


Figure 9 Configure tab in the 100GBASE-KR4 Test Application

4 In the **Connect** tab, view the instructions along with the connection digram to ensure that all requirements for the physical setup of the testing instruments and the DUT are met. Click **Connection Completed** to indicate to the Test Application that the required hardware setup is complete. The connection diagram for most of the tests matches the one shown in Figure 5 for

DSO-Q Series Oscilloscopes and Figure 7 for UXR Series Oscilloscopes. However, it is a good practice to verify the connection diagram and instructions displayed under this tab. The Test Application automatically indicates any changes in connections, if needed, during test runs.

5 Click **Run Tests** under this tab if you wish to start running tests. However, if you wish to modify the run settings before performing test runs, switch to the **Run** tab.

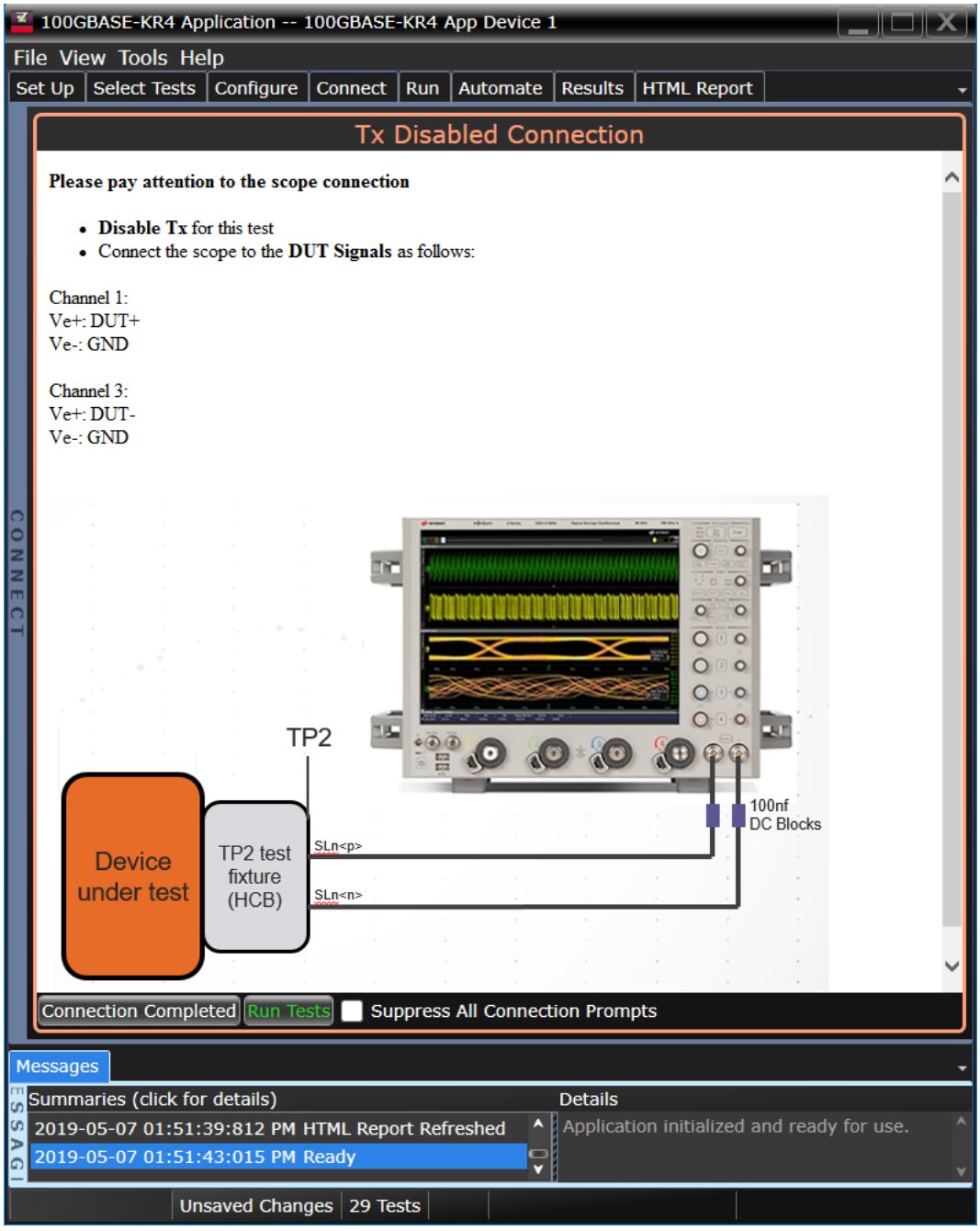


Figure 10 Connect tab in 100GBASE-KR4 Test Application on a Z-series DSO

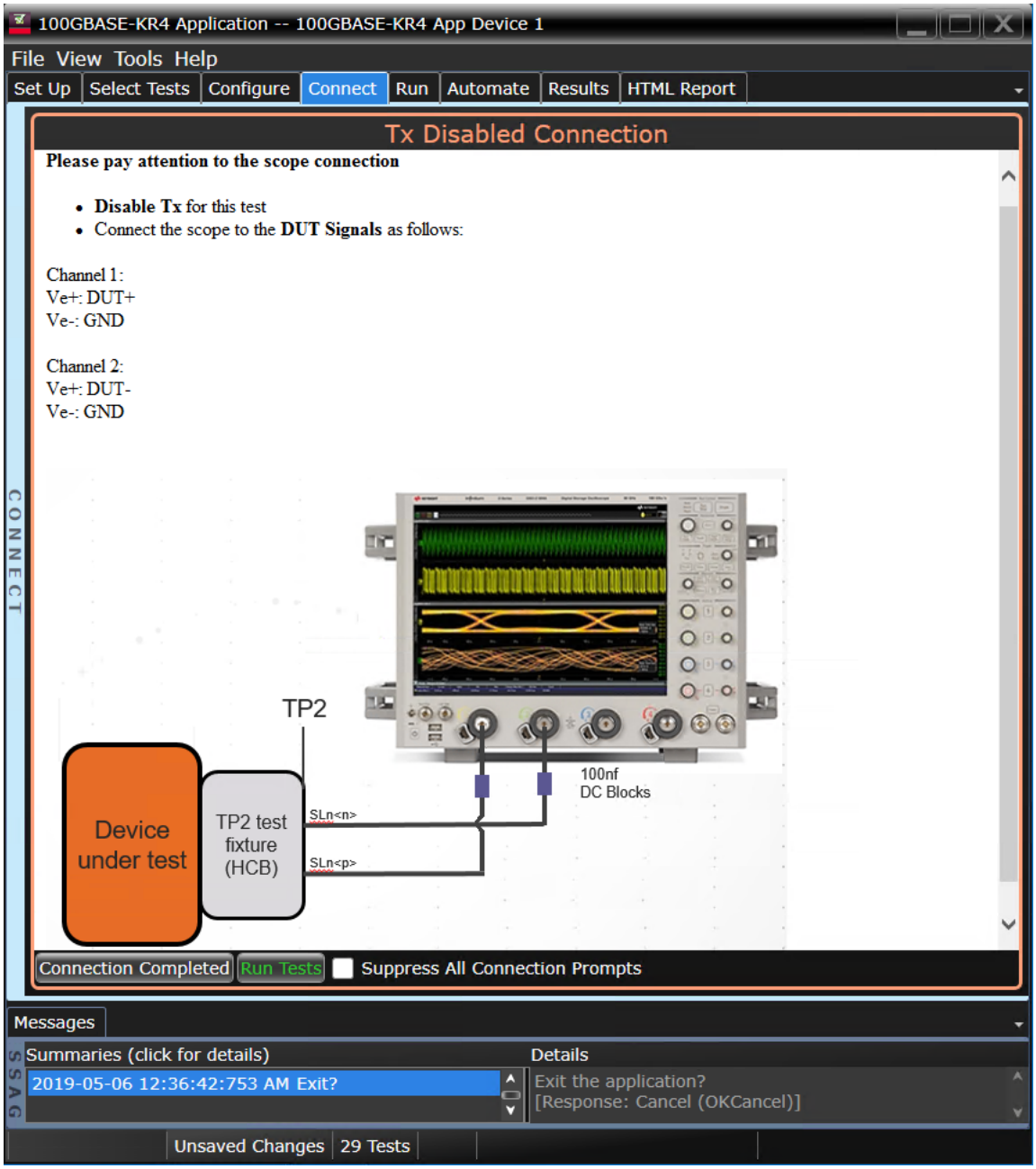


Figure 11 Connect tab in 100GBASE-KR4 Test Application on a UXR scope

6 In the **Run** tab, you may optionally modify one or more settings as described below, else click **Run** to start the test runs:

- determine the number of times each test must be run,
- automate specific actions in case of events,
- store results for certain type of test trials only,
- send email notifications if the test runs pause or stop during runs.

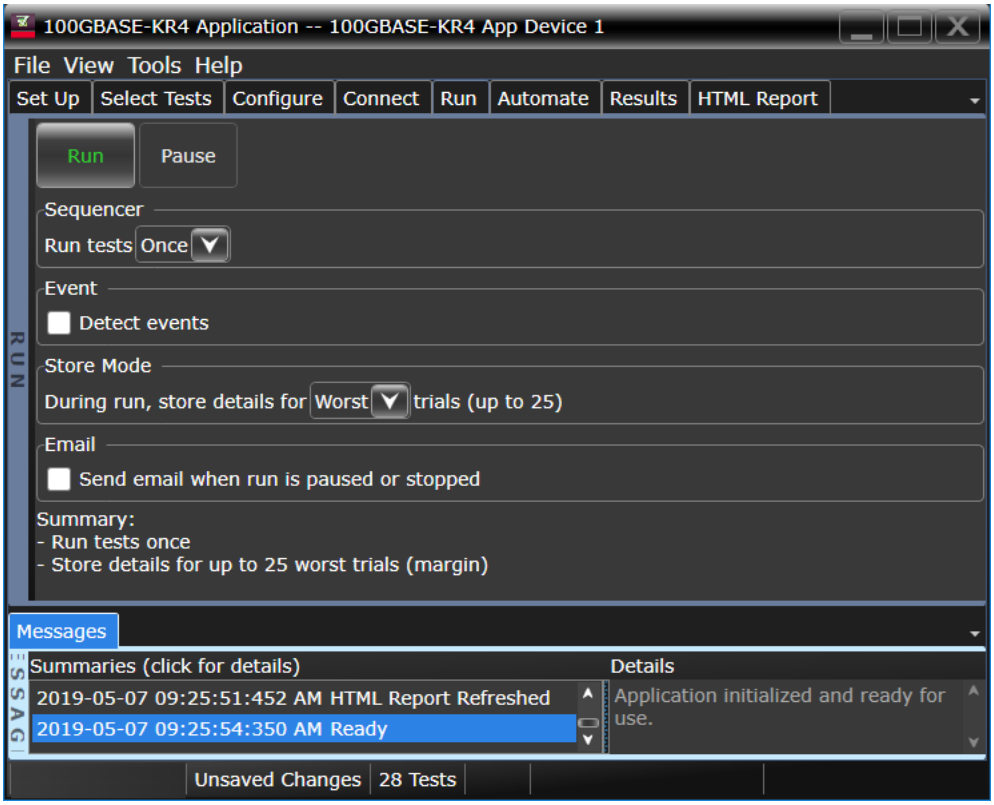


Figure 12 Run tab in 100GBASE-KR4 Test Application

7 In the **Automate** tab, you may optionally configure automation scripts to perform specific actions/sequences within the Test Application.

8 In the **Results** tab, which appears automatically after test runs are complete, view the test results displayed for each selected test.

9 In the **HTML Report** tab, view a comprehensive report for each test within the Application. The Test Application enables exporting these results in CSV or HTML format for the purpose of analysis.

To perform a high-level analysis on each measurement data, you may upload the results to the KS6800A Series Analytics Services Software. Refer to "Uploading Results to Repository" on page 80 to understand an overview on the functionality of this feature.

Configuring Switch Matrix

Overview

Devices, with 100GBASE-KR4 standard, can run with the switch matrix using four dual single-ended connections or without the switch matrix using four differential probe connections. Both options are fully automated to switch across the four lanes. Switch Matrix requires either the Keysight U3020A S26 or the BitifEye BIT2100.

This chapter describes the switch matrix feature and steps for configuring the switch matrix in the Keysight D9010BJBC 100GBASE-KR4 Test Application.

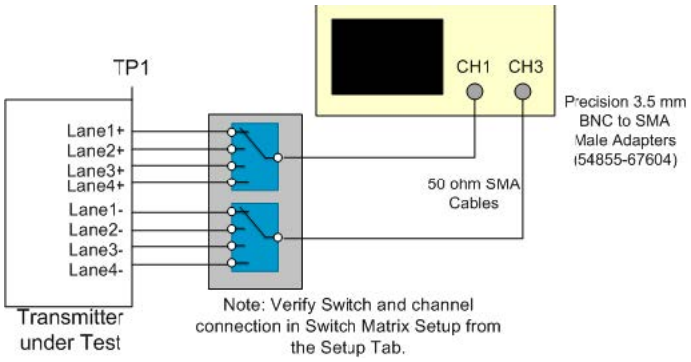
An Oscilloscope has only four Channels to run tests. The limited number of channels may, at times, limit the testing of some multi-lane standards. Also, it may prove to be a hindrance to run test procedures for multi-port devices or simultaneous testing of multiple devices. The Switch Matrix feature on the Infiniium Oscilloscope overcomes such limitations.

The purpose of the 'Switch Matrix' feature is to ease the testing procedure, make it more feasible and to reduce the overall time. Using this feature, you can connect multiple lanes of the source devices to the correct switches and to obtain an accurate signal path whenever required.

Keysight recommends the following switches to be used with the Test Application:

- Keysight U3020A S26
- BitifEye BIT-2100

The following figure shows the connection setup for 100GBASE-KR4 tests with the switch matrix.

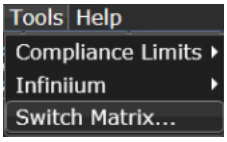


Enabling Switch Matrix

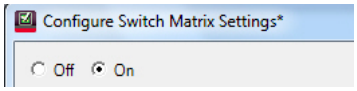
Before you begin the testing of multiple lane pairs of the source devices simultaneously, you must enable the Switch Matrix feature.

To enable the switch matrix feature:

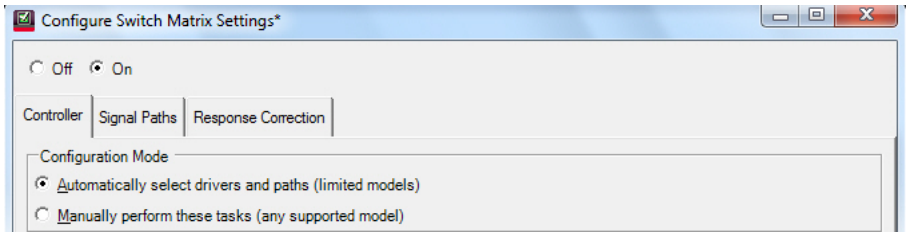
1 Click **Tools>Switch Matrix....**



2 In the **Configure Switch Matrix Settings** dialog box, click **On** to enable the Switch Matrix feature.



Enabling the Switch Matrix feature also enables the automated switch control. The option **Automatically select drivers and paths (limited models)** in the **Configuration Mode** section of the **Controller** tab is selected by default.

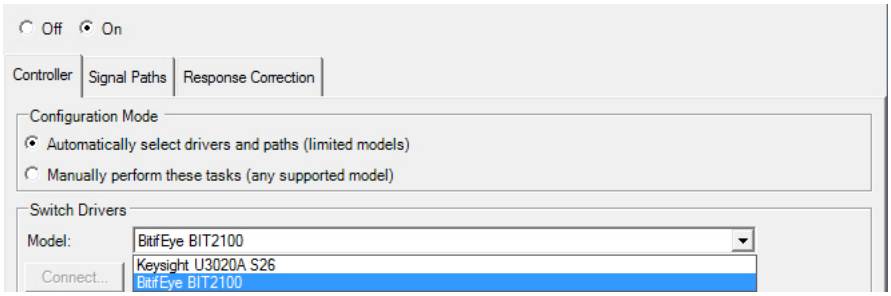


Establishing Connection to the Switch Drivers

Establishing connection to the Switch Drivers — Automatically

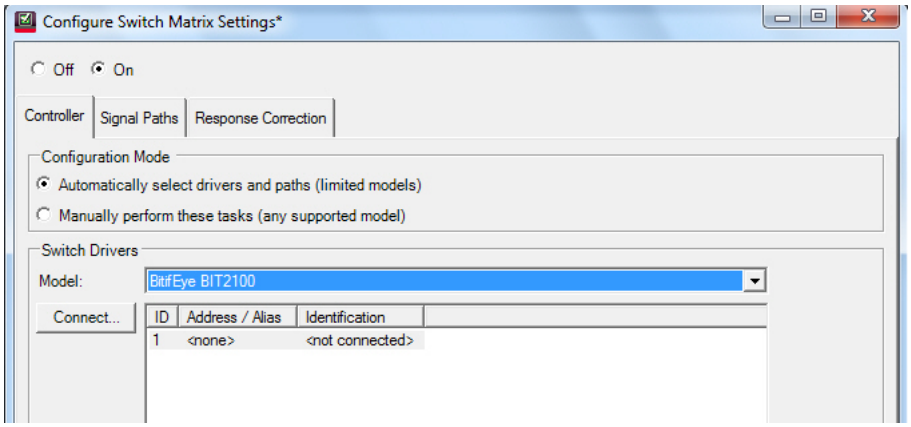
In the **Configure Switch Matrix Settings** dialog, under the **Controller** tab:

1 From the **Switch Drivers** section, select the switch model from the **Model**: drop-down options.



NOTE The switch settings and the response correction for all paths are reset if you toggle between switch models.

2 Click the **Connect** button to be able to connect the selected switch driver to a physical switch instrument.

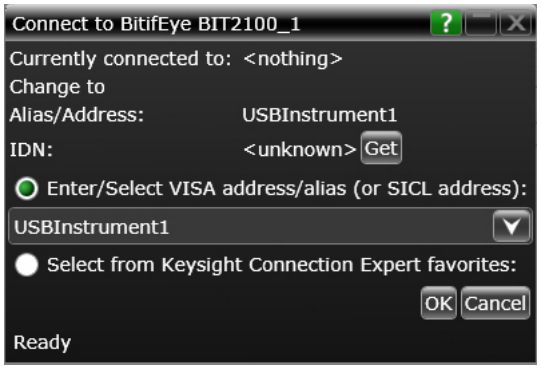


3 A **Connect to** <*switch-model*> dialog appears, which gives you two options to establish a connection to the selected switch models.

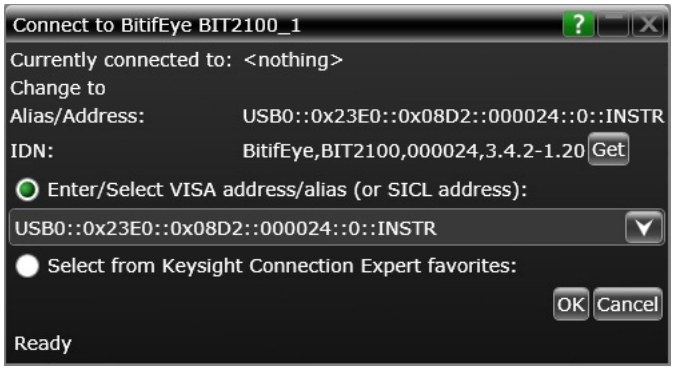
4 Select one of the options to establish connection:

Selecting Enter/Select VISA address/alias

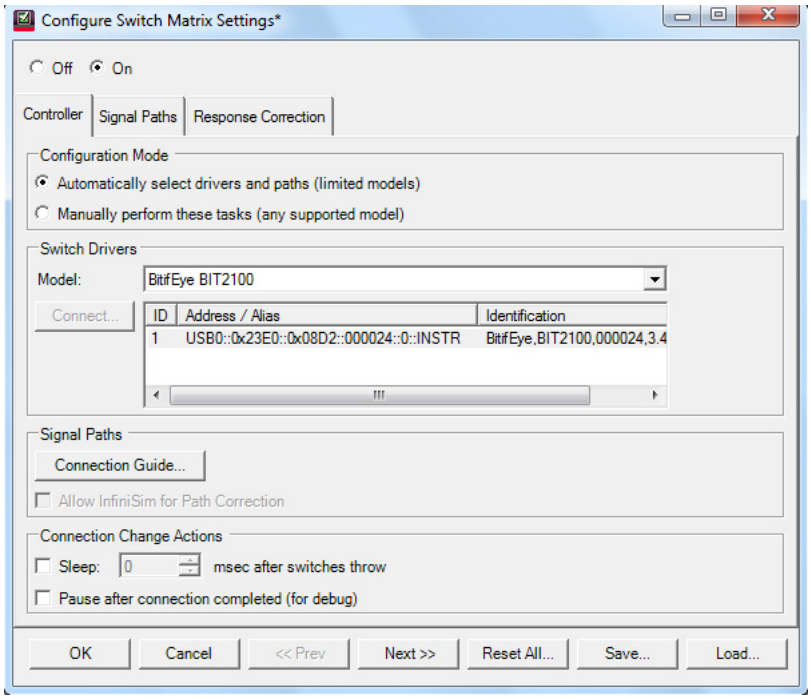
1 Select **Enter/Select VISA address/alias** to type the complete SICL or VISA address of the switch driver. By default, this option is selected.



2 Click the **Get** button to identify the instrument at the specified address or alias and to view the current status of the instrument that is connected to the switch driver.



3 Click **OK** to return to the **Configure Switch Matrix Settings** dialog. The connection to the selected switch is displayed.

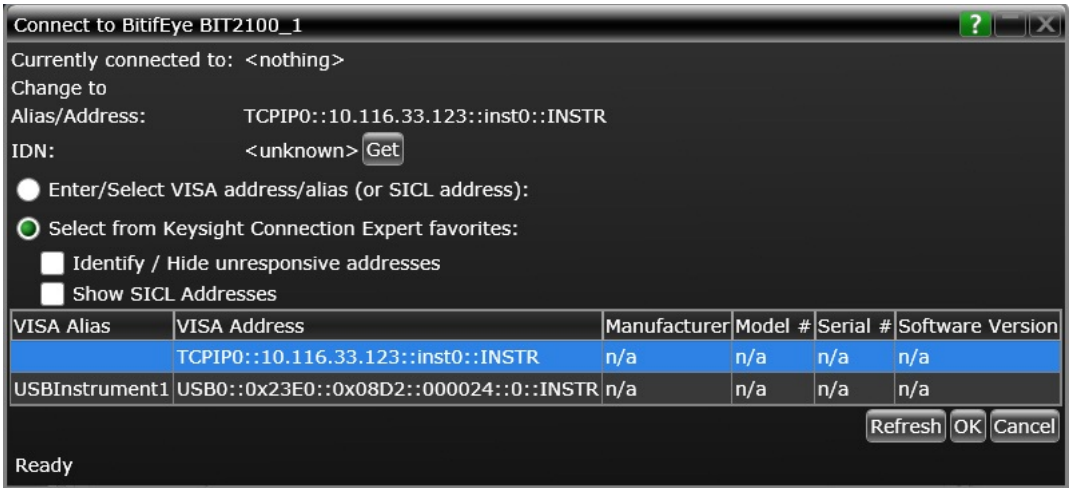


4 Click **OK** to save the settings and return to the test environment.

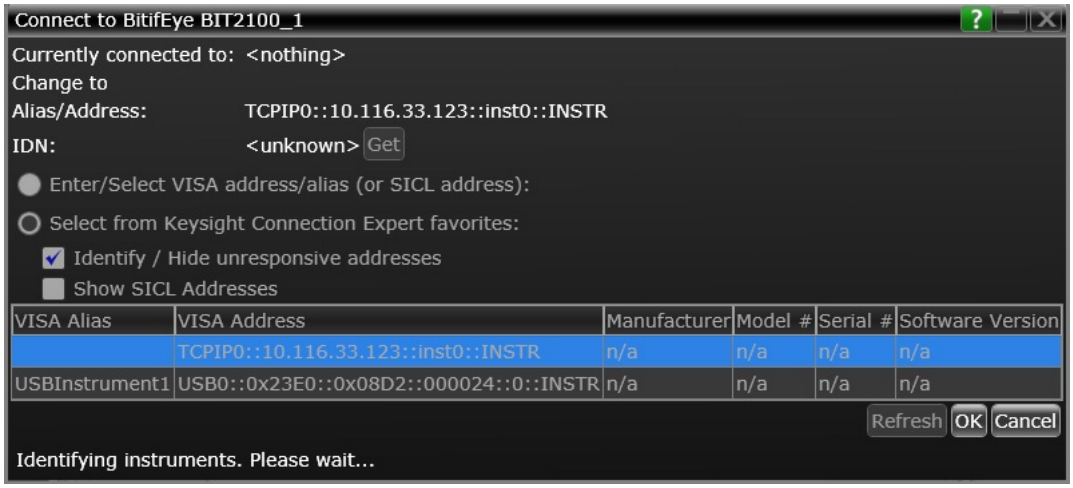
Selecting from Keysight Connection Expert favorites

1 Choose **Select from Keysight Connection Expert favorites** to control the application with the help of remote PC. Upon selecting this option, the application starts seeking device information from the Keysight Connection Expert.

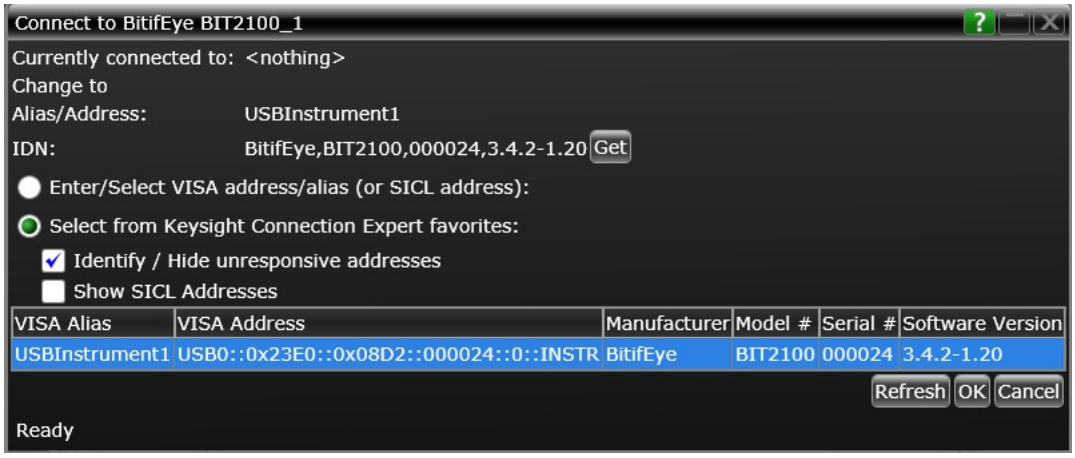
If remote access of the device is enabled, the **Connect to** <*switch-model*> dialog displays the list of active instruments.



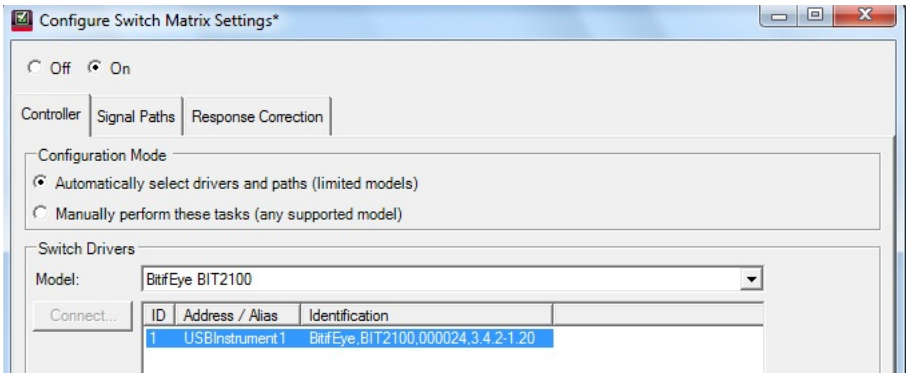
2 Click to select the **Identify / Hide unresponsive addresses** check box to run an IDN query to every instrument in the list and search for the active instruments, if any.



3 If any active instruments are found, the **Connect to** <*switch-model*> dialog lists out such instruments. Select the required instrument from the list.



4 Click **OK** to return to the **Configure Switch Matrix Settings** dialog. The connection to the selected switch is displayed.



5 Click **OK** in the **Configure Switch Matrix Settings** dialog to save the settings and return to the test environment.

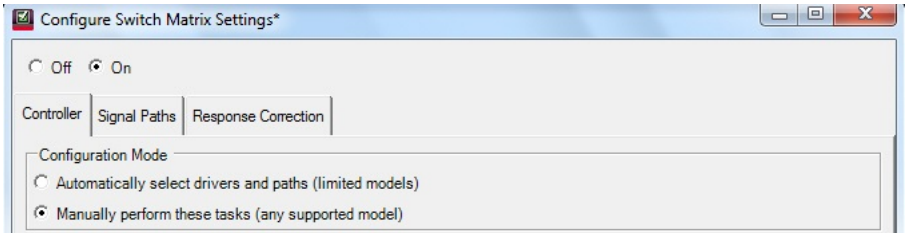
NOTE The **Select from Keysight Connection Expert** favorites option is available only when the device is powered on and enabled for remote access.

Establishing connection to the Switch Drivers – Manually

The **Manually perform these tasks (any supported model)** option allows you to decide how many drivers to use and how to route the signal paths. It enables the use of any supported switch model.

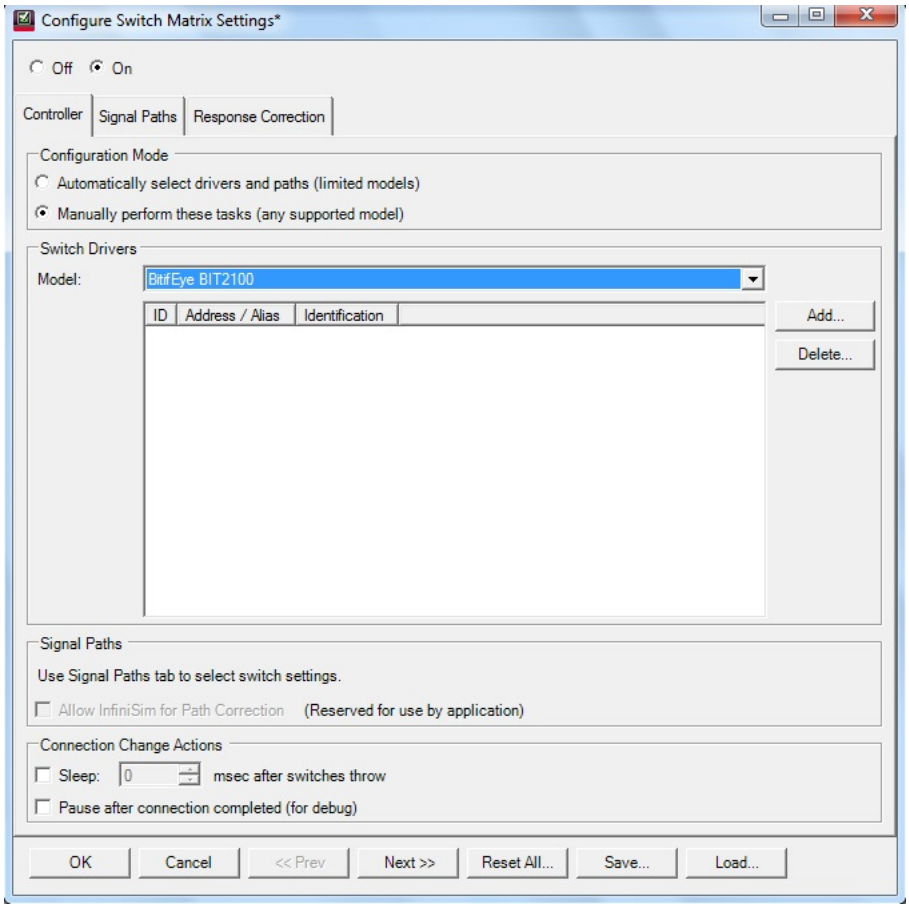
In the **Configure Switch Matrix Settings** dialog:

1 Click to select the **Manually perform these tasks (any supported model)** radio button in the **Configuration Mode** section.

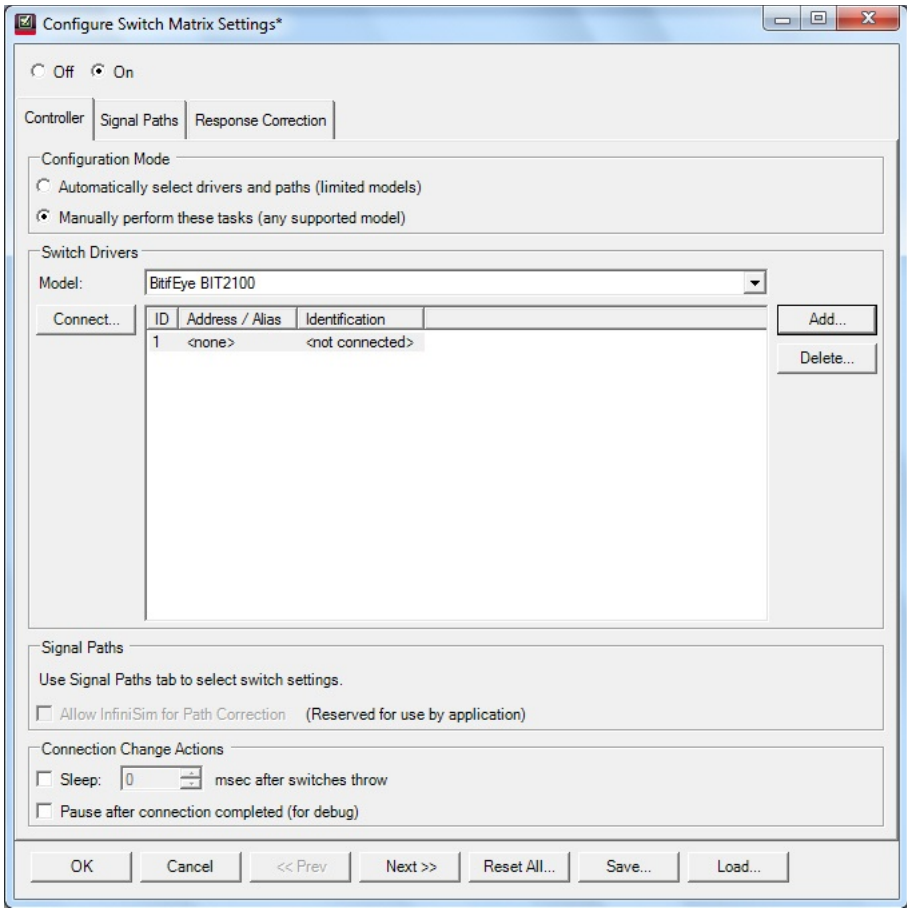


2 From the **Switch Drivers** section, select the switch model from the **Model:** drop-down options.

3 In the **Switch Drivers** section, you may use the **Add** button to append the list of any additional drivers, which require a connection to an instrument. Use the Delete button to remove a selected driver from the list. Removing the driver from the list dissociates any signal paths that may have been assigned to it earlier.


Configure Switch Matrix Settings*
Off
On
Controller
Signal Paths
Response Correction
Configuration Mode
Automatically select drivers and paths (limited models)
Manually perform these tasks (any supported model)
Switch Drivers
Model:
BitifEye BIT2100
ID
Address / Alias
Identification
Add...
Delete...
Signal Paths
Use Signal Paths tab to select switch settings.
Allow InfiniSim for Path Correction
(Reserved for use by application)
Connection Change Actions
Sleep:
0
msec after switches throw
Pause after connection completed (for debug)
OK
Cancel
<< Prev
Next >>
Reset All...
Save...
Load...

4 When you click the **Add**... button, the **Connect**... button appears so that you can establish connectivity to the selected Switch.



5 The rest of the steps for establishing a connection to the switch model remains the same as described in the previous section. The only difference between automatic and manual modes is that you can add/delete and select switch drivers (any supported model) as per your requirements and preferences in the manual mode.

Configuring Signal Paths

Once you have enabled the Switch Matrix feature and set up connections to the switch drivers, you must configure signal paths. The options to configure the signal paths vary depending upon whether you have selected **Automatically select drivers and paths (limited models)** or **Manually perform these tasks (any supported model)** in the **Controller** tab of the **Configure Switch Matrix Settings** dialog.

Refer to the connection diagram before configuring signal paths either for Automatic or Manual selection. Under the Controller tab, click the **Connection Guide** button to access the Connection Diagram dialog.

Configuring Signal Paths with Automatic Selection

When you have selected **Automatically select drivers and paths (limited models)** in the **Controller** tab of the **Configure Switch Matrix Settings** dialog:

1 Click the **Signal Paths** tab. The **Path Assignment** table lists the connection matrix of the device with the Switch modules.

2 Scroll down to view the automatic connections that have been established.

At runtime, when the Switch Matrix module is on and when a connection prompt occurs, two events occur:

- The framework suppresses the prompts.
- The Switch Matrix module detects the new connection and then throw switches, as indicated in the Switch column, taking into account the current value of the configuration variable (if any) associated with the connection.

Configuring Signal Paths with Manual Selection

When you have selected **Manually perform these tasks (any supported model)** in the **Controller** tab of the **Configure Switch Matrix Settings** dialog:

1 Click the **Signal Paths** tab in the **Configure Switch Matrix Settings** dialog.

2 Select the channel or switch module in one of the drop-down options. Manually select the alternative channel or driver module from the other drop-down option.

3 Optionally, you may change the lane assignments and the corresponding Switch modules.

4 Click the **View Connections...** button to view the signal path mapping, to understand how the signal path maps to the connection diagrams being used by the application.

5 The **Signal Paths Connection View** dialog is displayed. Select any one of the available options in the **Connection**: drop-down.

6 The **Path Assignment & Response Correction** area displays the connections configured for the corresponding connection diagrams in the **Connection:** drop-down.

7 Select an entry in the **Path Assignment & Response Correction** area to view the corresponding test information.

8 Click the **Tests...** button to view information about the tests that use the selected connection to perform automated tests.

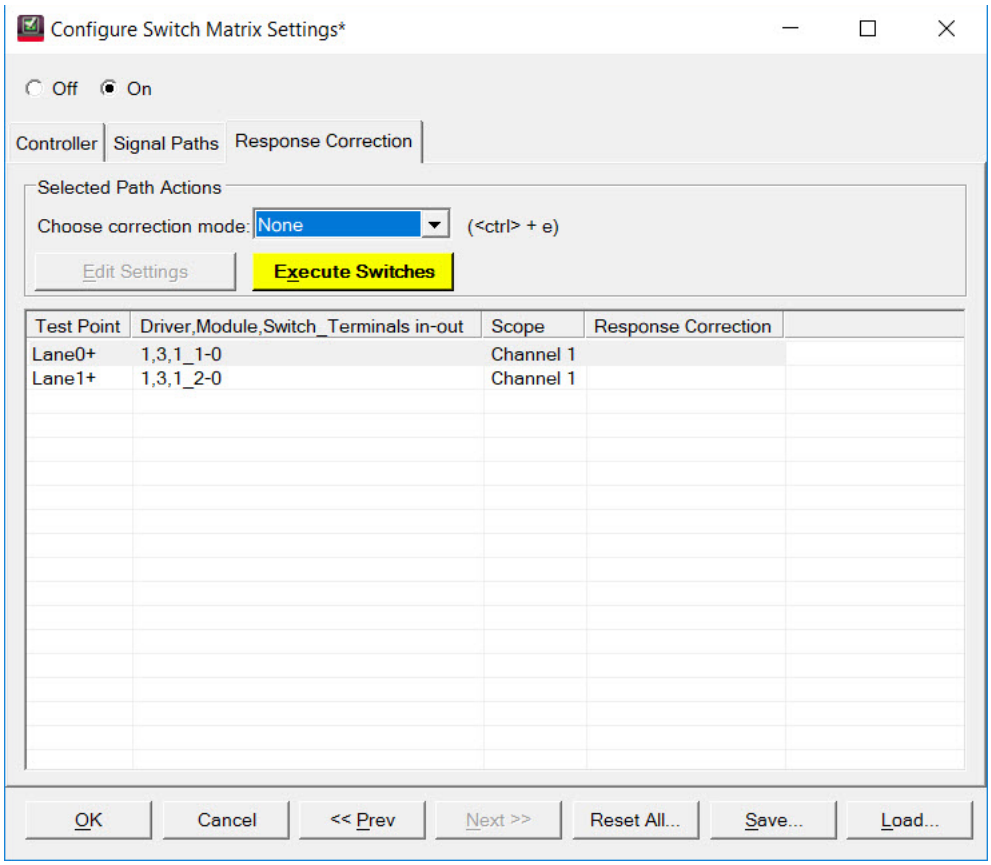
9 Click the **Close** button to exit and return to the **Configure Switch Matrix Settings** dialog to finish the signal path configuration.

10 If required, use the **Reset Paths...** button to clear all switch and response correction settings for all paths. Click **OK** if you wish to proceed.

11 Also, if needed, use the **Load Preconfigured Settings...** button to set switches for all paths as per the recommended settings. Click **OK** if you wish to proceed.

Response Correction

You must specify the response correction after you finish configuring the signal paths. Configuring this area is vital as it impacts the measurement accuracy, credibility and performance of the Oscilloscope. The purpose of response correction is to correct the channel frequency response of the oscilloscope.

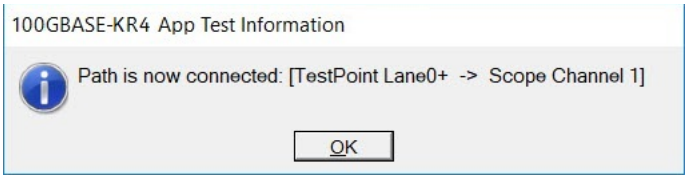


For each scope channel that you select, the default response correction method is None, which turns off normalization for the specified path.

You may use the **Edit Settings** button or double-click the selected row to access the corresponding configuration dialog, if you wish to make further changes to a specific scope channel configuration.

Use the **Execute Switches** button to establish a connection between the selected test point and scope channel. The color of this button corresponds to the Oscilloscope Channel where the Switch is connected to.

In the following example, the application displays the prompt indicating that a connection is established when you click **Execute Switches** after selecting the first row. Click **OK** to close the prompt.



Once you have finished response corrections for all connections, click **OK** in the **Configure Switch Matrix Settings** dialog. The application redirects you to the test environment.

4 Main Voltage Measurements

Differential Peak to Peak Output Voltage Test with TX Disabled 41
DC Common Mode Output Voltage Test 42
AC Common Mode Output Voltage Test 43
Differential Peak to Peak Output Voltage Test 44

This section provides the Methods of Implementation (MOIs) for the Main Voltage Measurements using a Keysight Infiniium oscilloscope and the 100GBASE-KR4 Test Application.

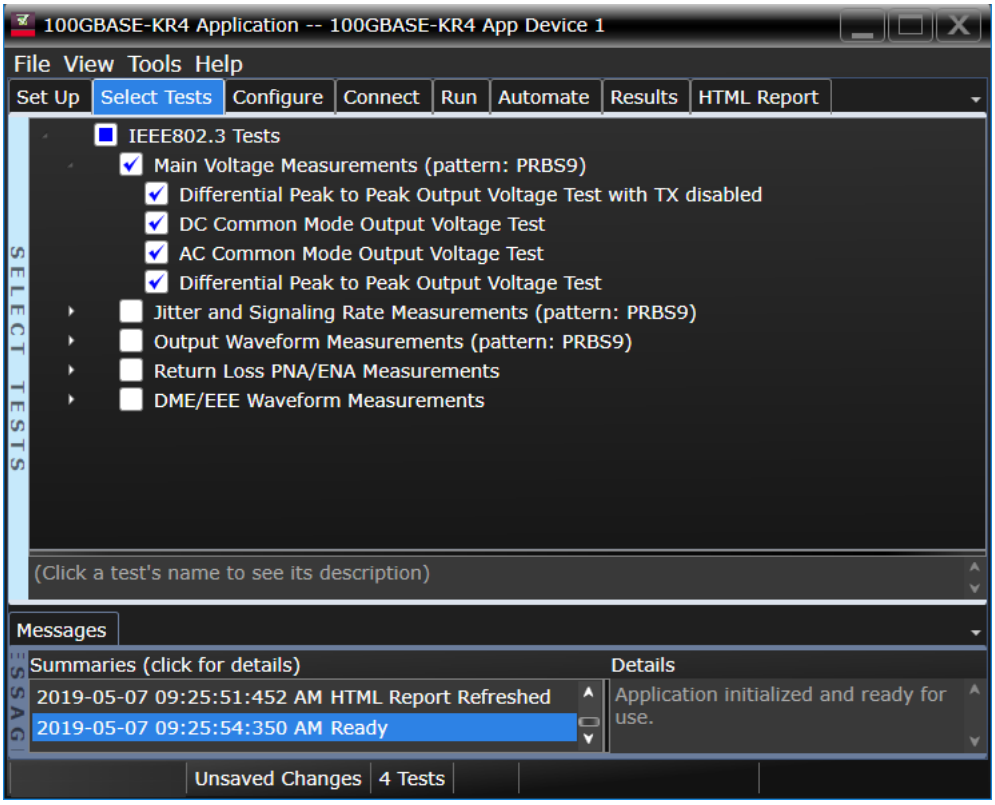


Figure 13 Tests under Main Voltage Measurements

Limits for Main Voltage Measurements

The limits for tests under main voltage measurements can be found in section 93.8.1.3 of IEEE 802.3 specifications. Refer to Table 93-4 for corresponding values.

- Differential Peak to Peak Output Voltage with TX disabled (max 30 mV).
- DC Common Mode Output Voltage (0-1.9 V).
- AC Common Mode Output Voltage (max 12 mV).
- Differential Peak to Peak Output Voltage (max 1200 mV).

Differential Peak to Peak Output Voltage Test with TX Disabled

The purpose of this test is to verify that when TX is disabled the peak-to-peak voltage is less than 30 mV.

PASS Condition

The max peak-to-peak voltage is less than 30 mV.

Measurement Algorithm

1 Obtain sample or acquire signal data.
2 Check that the signal is truly with TX disabled (no valid data transitions).
3 Measure peak-to-peak voltage of the signal.
4 Compare the max peak-to-peak voltage to 30 mV.

DC Common Mode Output Voltage Test

The purpose of this test is to verify that the common mode signal of the differential pair is between 0-1.9 V.

NOTE This measurement can be done only with dual-single ended connection; it cannot be done with a differential probing connection.

PASS Condition The signal is between 0-1.9 V.

Measurement Algorithm

1 Obtain sample or acquire signal data.

2 Verify that there is a signal and that the connection is dual-single ended.

3 Measure the V_{max} and V_{min} and get the worst result.

- If the Test Application is running on the DSO Oscilloscope, the Instrument Setup is preset to Real Edge.
- If the Test Application is running on the UXR Oscilloscope, perform the measurement with the Instrument Setup set to Channels 1 and 2. Repeat the measurement with the Instrument Setup set to Channels 3 and 4.

4 Compare the voltage measurement to 0-1.9 V.

AC Common Mode Output Voltage Test

The purpose of this test is to verify that the common mode signal of the differential pair rms voltage does not exceed 12 mV.

NOTE This measurement can be done only with dual-single ended connection; it cannot be done with a differential probing connection.

PASS Condition The signal is less than 12 mV.

Measurement Algorithm

1 Obtain sample or acquire signal data.
2 Verify that there is a signal and that the connection is dual-single ended.
3 Measure the V_{rms} of the addition of channel 1 and 3 or channel 2 and 4.
4 Compare the voltage measurement to 12 mV.

Differential Peak to Peak Output Voltage Test

The purpose of this test is to verify that the peak-to-peak voltage of the differential signal on a PRBS9 pattern is less than 1200 mV.

PASS Condition

The differential signal max peak to peak voltage on a PRBS9 pattern is less than 1200 mV.

Measurement Algorithm

1. Obtain sample or acquire signal data.
2. Verify that there is a signal is connected and has a PRBS9 pattern.
3. Measure the peak-to-peak voltage of the differential signal of DUT+ and DUT-.
4. Compare the max peak-to-peak voltage to 1200 mV.

5 Jitter and Signaling Rate Measurements

Signaling Rate 47
Jitter (Even-Odd Jitter, Bounded Uncorrelated Jitter, Total Uncorrelated Jitter) 48

This section provides the Methods of Implementation (MOIs) for the Jitter and Signaling Rate Measurements using a Keysight Infiniium oscilloscope and the 100GBASE-KR4 Test Application.

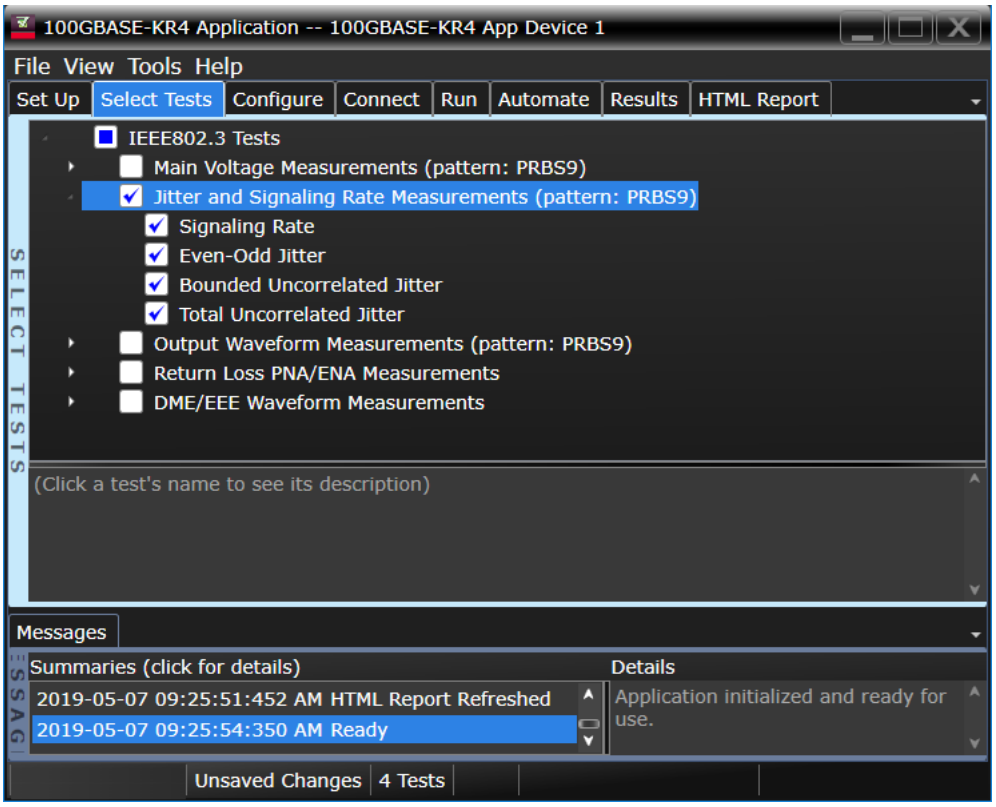


Figure 14 Tests under Jitter and Signaling Rate Measurements

Limits for Jitter and Signaling Rate Measurements

The limits for tests under jitter and signaling rate measurements can be found in various sections of IEEE 802.3 specification. Refer to Table 93-4 for corresponding values.

- Signaling Rate (25.78125 ±100 ppm GBd) (section 93.8.1.2)
- Even-Odd Jitter (max 35 mUI) (section 93.8.1.7)
- Bounded Uncorrelated Jitter (max 100 mUI) (section 93.8.1.7)
- Total Uncorrelated Jitter (max 180 mUI) (section 93.8.1.7)

Signaling Rate

The purpose of this test is to verify that the signaling rate mean is between 25.78125 ±100 ppm GBd.

PASS Condition The mean signaling rate is between 25.78125 ±100 ppm GBd.

Measurement Algorithm

1 Obtain sample or acquire signal data.
2 Check that signal is connected and data pattern exists (PRBS9 must be used for this test).
3 Set memory depth to capture the number or UI set in the configuration tab.
4 Set data rate measurement to semi-automatic 25.78125 Gb/s.
5 Measure min, max, mean data rate.
6 Report min and max values.
7 Compare and report the mean data rate value to 25.78125 ±100 ppm GBd.

Jitter (Even-Odd Jitter, Bounded Uncorrelated Jitter, Total Uncorrelated Jitter)

The purpose of this test is to verify that differential signal's Even-Odd Jitter is less that 35 mUI, Bounded Uncorrelated Jitter is less than 100 mUI, and Total Uncorrelated Jitter is less than 180 mUI. If all tests are selected, all tests are run on a single measurement. Each test can be run individually by selecting any or some of the tests.

PASS Conditions

- Even-Odd Jitter is less than 35 mUI.
- BUJ is less than 100 mUI.
- Total Uncorrelated Jitter rms is less than 180 mUI.

Measurement Algorithm

1. Obtain sample or acquire signal data.
2. Check that signal is connected and data pattern exists (PRBS9 must be used for this test).
3. Set memory depth to capture the number or UI set in the configuration tab.
4. Set clock recovery to OJTF First Order PLL with Nominal Data Rate 25.78125 Gb/s and Loop Bandwidth to 10 MHz.
5. Using EZJIT, measure Even-Odd Jitter, BUJ, and TUJ at BER of 10E-12.
6. Compare and report the values to their respective maximum specification.

6 Output Waveform Measurements

Steady State Voltage Vf 51
Linear Fit Pulse Peak 52

This section provides the Methods of Implementation (MOIs) for the Transmitter Output Waveform Measurements using a Keysight Infiniium oscilloscope and the 100GBASE-KR4 Test Application.

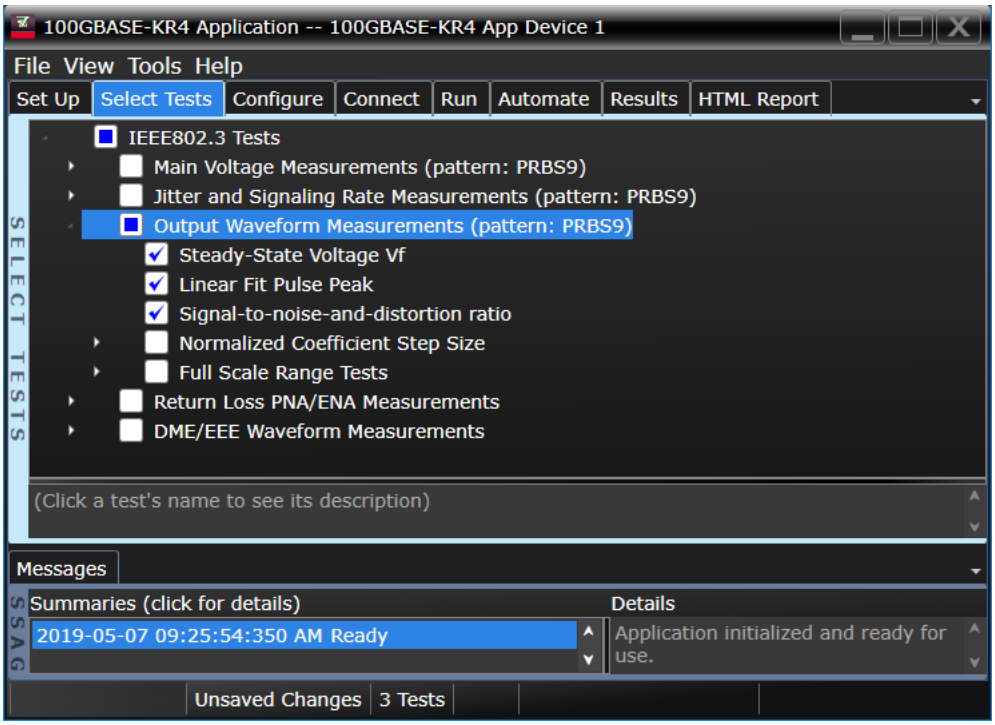


Figure 15 Tests under Output Waveform Measurements

Limits for Output Waveform Measurements

The limits for some tests under output waveform measurements can be found in various sections of IEEE 802.3 specification. Refer to Table 93-4 for corresponding values.

- Steady State Voltage Vf (400-600 mV) (section 93.8.1.5.2)
- Linear Fit Pulse Peak (0.71 * Vf) (section 93.8.1.5.2)
- Signal-to-noise-and-distortion ratio (27 dB) (section 93.8.1.6)

Steady State Voltage Vf

The purpose of this test is to verify that the Steady State Voltage as described in section 85.8.3.3 is between 0.4 and 0.6 V.

PASS Condition The Steady State Voltage is between 0.4 and 0.6 V.

Measurement Algorithm

1 Set memory depth to capture one full PRBS9 pattern and scale.

2 Calculate Vf using the equations in section 92.8.3.7. The result value is the sum of the columns in P1 (Equ 92-9).

3 Compare and report the result to 0.4-0.6 V.

Linear Fit Pulse Peak

The purpose of this test is to verify that the Linear Fit Pulse as described in section 85.8.3.3 is greater than the V_f * 0.71 for 100GBASE-KR4 and 0.75*V_f for 25GBASE-KR.

PASS Condition

The Linear Fit Pulse is greater than V_f * 0.71 for 100GBASE-KR4 and V_f * 0.75 for 25GBASE-KR standard.

Measurement Algorithm

1 Set memory depth to capture one full PRBS9 pattern and scale.

2 Calculate p(k) linear fit using the equations in section 85.8.3.3.5. The result value is the max of p(k).

3 Compare and report the result to 0.71*V_f for 100GBASE-KR4 and 0.75*V_f for 25GBASE-KR.

Signal-to-noise-and-distortion ratio

The purpose of this test is to verify that the Signal-to-noise-and-distortion ratio (SNDR) is greater than 27dB.

PASS Condition The SNDR must be greater than 27dB.

Measurement Algorithm

1 Calculate SNDR using measurements from Level RMS - PRBS pattern test and error from Linear Fit Pulse Peak test.

2 Compare and report the value of SNDR with 27dB.

7 Normalized Coefficient Step Size Measurements

abs Coefficient Step Size c(1) inc c(0)hold c(-1)hold 57
abs Coefficient Step Size c(1)dec c(0)hold c(-1)hold 58
abs Coefficient Step Size c(1)hold c(0)inc c(-1)hold 59
abs Coefficient Step Size c(1)hold c(0)dec c(-1)hold 60
abs Coefficient Step Size c(1)hold c(0)hold c(-1)inc 61
abs Coefficient Step Size c(1)hold c(0)hold c(-1)dec 62

This section provides the Methods of Implementation (MOIs) for the Transmitter Output Waveform Normalized Coefficient Step Size Measurements using a Keysight Infiniium oscilloscope and the 100GBASE-KR4 Test Application.

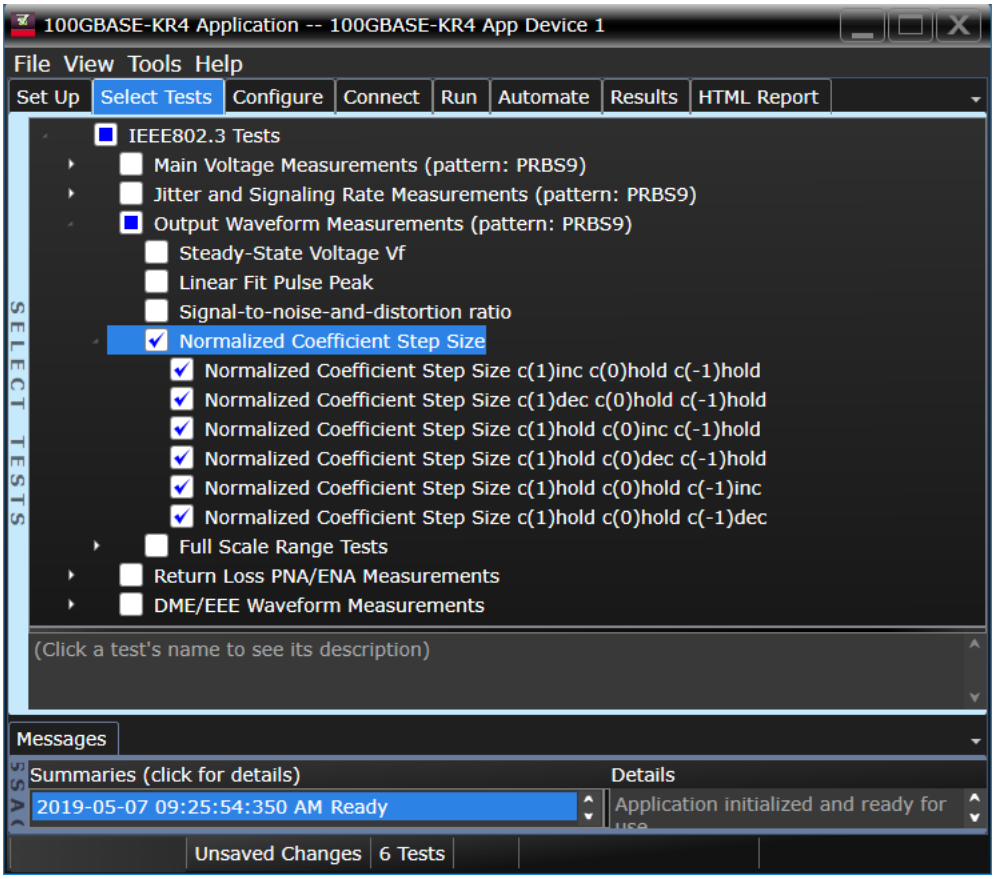


Figure 16 Tests under Normalized Coefficient Step Size Measurements

Limits for Normalized Coefficient Step Size Measurements

The limits for tests under normalized coefficient step size measurements can be found in various sections of IEEE 802.3 specification. Refer to Table 93-4 for corresponding values.

- abs coefficient step size (min. 0.0083) (section 93.8.1.5.4)
- abs coefficient step size (max. 0.05) (section 93.8.1.5.4)

abs Coefficient Step Size c(1) inc c(0)hold c(-1)hold

The purpose of this test is to verify that the difference amplitude between coefficient updates falls between the specified values 0.0083 and 0.05.

PASS Condition

The difference in the coefficient update when c(1) is incremented to the previous is within 0.0083 to 0.05.

Measurement Algorithm

1 Request transmitter to be set to 'PRESET' condition.
2 Set memory depth to capture one full PRBS9 pattern and scale.
3 Calculate linear fit pulse response at 'PRESET' condition.
4 Define matrix Rm using Equation (92-4) from IEEE802.3.
5 Request to change the Tx setting to a Baseline condition that allows for increment.
6 Calculate the coefficients defined in (92-5).
7 Request to change the Tx setting to increment.
8 Calculate linear fit pulse response.
9 Calculate coefficients of new waveform with equation (92-5).
10 Compare result to previous setting.
11 Loop steps 7 – 10 for as many increments to be tested.
12 Compare and report the values and verify they are in the range of 0.0083 to 0.05.

abs Coefficient Step Size c(1)dec c(0)hold c(-1)hold

The purpose of this test is to verify that the difference in amplitude between the coefficient updates, falls between the specified values of -0.0083 to -0.05.

PASS Condition

The difference in the coefficient update when c(1) is decremented to the previous is within -0.0083 to -0.05.

Measurement Algorithm

1 Request transmitter to be set to 'PRESET' condition.
2 Set memory depth to capture one full PRBS9 pattern and scale.
3 Calculate linear fit pulse response at 'PRESET' condition.
4 Define matrix Rm using Equation (92-4) from IEEE802.3.
5 Request to change the Tx setting to a Baseline condition that allows for decrement.
6 Calculate the coefficients defined in (92-5).
7 Request to change the Tx setting to decrement.
8 Calculate linear fit pulse response.
9 Calculate coefficients of new waveform with equation (92-5).
10 Compare result to previous setting.
11 Loop steps 7 – 10 for as many decrements to be tested.
12 Compare and report the values and verify they are in the range of -0.05 to -0.0083 for dec.

abs Coefficient Step Size c(1)hold c(0)inc c(-1)hold

The purpose of this test is to verify that the difference in amplitude between the coefficient updates falls between the specified values of 0.0083 to 0.05.

PASS Condition

The difference in the coefficient update when c(0) is incremented to the previous state is within 0.0083 to 0.05.

Measurement Algorithm

1 Request transmitter to be set to 'PRESET' condition.
2 Set memory depth to capture one full PRBS9 pattern and scale.
3 Calculate linear fit pulse response at 'PRESET' condition.
4 Define matrix Rm using Equation (92-4) from IEEE802.3.
5 Request to change the Tx setting to a Baseline condition that allows for increment.
6 Calculate the coefficients defined in (92-5).
7 Request to change the Tx setting to increment.
8 Calculate linear fit pulse response.
9 Calculate coefficients of new waveform with equation (92-5).
10 Compare result to previous setting.
11 Loop steps 7 – 10 for as many increments to be tested.
12 Compare and report the values and verify they are in the range of 0.0083 to 0.05.

abs Coefficient Step Size c(1)hold c(0)dec c(-1)hold

The purpose of this test is to verify that the difference in amplitude between the coefficient updates falls between the specified values of -0.0083 to -0.05.

PASS Condition

The difference in the coefficient update when c(0) is decremented to the previous state is within -0.0083 and -0.05.

Measurement Algorithm

1 Request transmitter to be set to 'PRESET' condition.
2 Set memory depth to capture one full PRBS9 pattern and scale.
3 Calculate linear fit pulse response at 'PRESET' condition.
4 Define matrix Rm using Equation (92-4) from IEEE802.3.
5 Request to change the Tx setting to a Baseline condition that allows for decrement.
6 Calculate the coefficients defined in (92-5).
7 Request to change the Tx setting to decrement.
8 Calculate linear fit pulse response.
9 Calculate coefficients of new waveform with equation (92-5).
10 Compare result to previous setting.
11 Loop steps 7 – 10 for as many decrements to be tested.
12 Compare and report the values and verify they are in the range of -0.05 to -0.0083 for dec.

abs Coefficient Step Size c(1)hold c(0)hold c(-1)inc

The purpose of this test is to verify that the difference in amplitude between the coefficient updates falls between the specified values of 0.0083 to 0.05.

PASS Condition

The difference in the coefficient update when c(-1) is incremented to the previous state is within 0.0083 and 0.05.

Measurement Algorithm

1 Request transmitter to be set to 'PRESET' condition.
2 Set memory depth to capture one full PRBS9 pattern and scale.
3 Calculate linear fit pulse response at 'PRESET' condition.
4 Define matrix Rm using Equation (92-4) from IEEE802.3.
5 Request to change the Tx setting to a Baseline condition that allows for increment.
6 Calculate the coefficients defined in (92-5).
7 Request to change the Tx setting to increment.
8 Calculate linear fit pulse response.
9 Calculate coefficients of new waveform with equation (92-5).
10 Compare result to previous setting.
11 Loop steps 7 – 10 for as many increments to be tested.
12 Compare and report the values and verify they are in the range of 0.0083 to 0.05.

abs Coefficient Step Size c(1)hold c(0)hold c(-1)dec

The purpose of this test is to verify that the difference in amplitude between the coefficient updates falls between the specified values of -0.0083 to -0.05.

PASS Condition

The difference in the coefficient update when c(-1) is decremented to the previous state is within -0.0083 and -0.05.

Measurement Algorithm

1 Request transmitter to be set to 'PRESET' condition.
2 Set memory depth to capture one full PRBS9 pattern and scale.
3 Calculate linear fit pulse response at 'PRESET' condition.
4 Define matrix Rm using Equation (92-4) from IEEE802.3.
5 Request to change the Tx setting to a Baseline condition that allows for decrement.
6 Calculate the coefficients defined in (92-5).
7 Request to change the Tx setting to decrement.
8 Calculate linear fit pulse response.
9 Calculate coefficients of new waveform with equation (92-5).
10 Compare result to previous setting.
11 Loop steps 7 – 10 for as many decrements to be tested.
12 Compare and report the values and verify they are in the range of -0.05 to -0.0083 for dec.

8 Full Scale Range Tests

Minimum Pre-cursor Full-scale Test 65
Minimum Post-cursor Full-scale Test 66

This section provides the Methods of Implementation (MOIs) for the Transmitter Output Waveform Full-Scale Range Measurements using a Keysight Infiniium oscilloscope and the 100GBASE-KR4 Test Application.

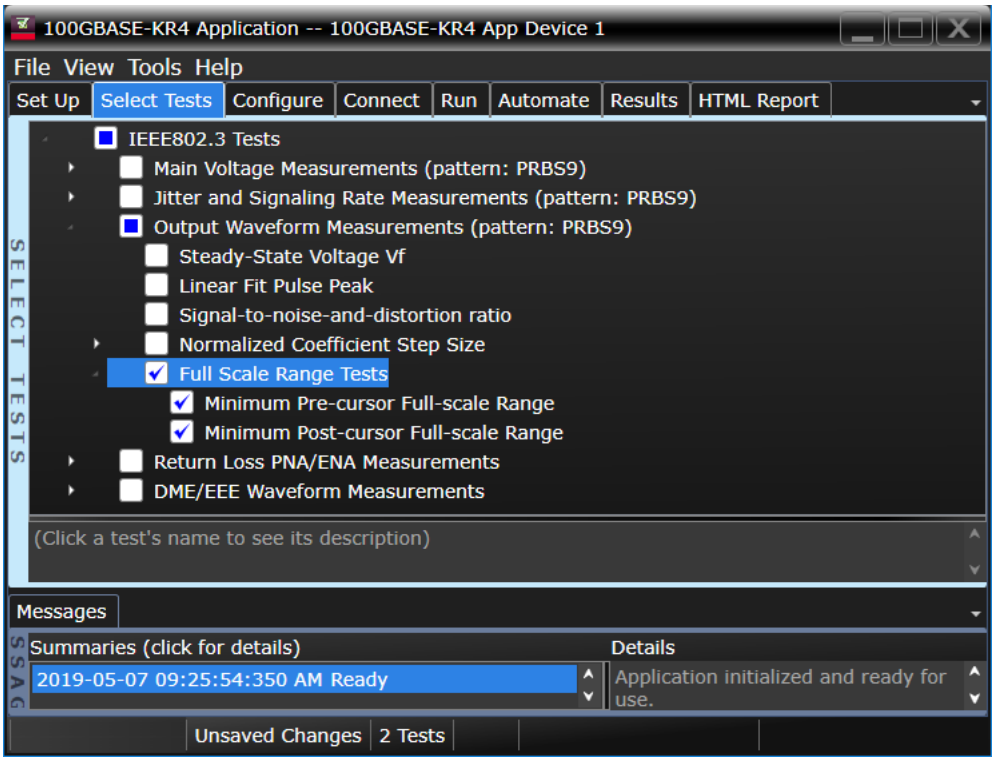


Figure 17 Tests under Full-Scale Range Measurements

Limits for Full Scale Range Tests

The limits for tests under full scale range tests can be found in various sections of IEEE 802.3 specification. Refer to Table 93-4 for corresponding values.

- minimum Pre-cursor Full-scale Range (1.54) (section 93.8.1.5.5)
- minimum Post-cursor Full-scale Range (4) (section 93.8.1.5.5)

Minimum Pre-cursor Full-scale Test

The purpose of this test is to verify that the minimum Pre-cursor is greater than or equal 1.54.

PASS Condition

When the coefficients are set to c(1) zero c(0) minimum and c(-1) minimum, the pre-cursor full-scale ratio is greater than or equal 1.54.

Measurement Algorithm

1 Request transmitter to be set to 'PRESET' condition (only if not previously have 'PRESET' measurement on same trial from step size).

2 Set memory depth to capture one full PRBS9 pattern and scale.

3 Calculate linear fit pulse response at 'PRESET' condition (if not previously done in same trial on step size).

4 Define matrix Rm using Equation (92-4) from IEEE 802.3 (if not previously done in same trial on step size).

5 Request to change the Tx setting to c(-1) zero and c(0) and c(1) to their minimum values.

6 Calculate linear fit pulse response.

7 Calculate coefficients with equation (92-5).

8 Calculate precursor ratio (c(0) – c(-1))/(c(0) + c(-1)).

9 Report and compare the value calculated in step 8 with 1.54.

Minimum Post-cursor Full-scale Test

The purpose of this test is to verify that the minimum Post-cursor is greater than or equal to 4.

PASS Condition

When the coefficients are set to c(1) minimum c(0) minimum and c(-1) zero, the post-cursor full-scale ration is greater than or equal to 4.

Measurement Algorithm

1 Request transmitter to be set to 'PRESET' condition (only if not previously have 'PRESET' measurement on same trial from step size).

2 Set memory depth to capture one full PRBS9 pattern and scale.

3 Calculate linear fit pulse response at 'PRESET' condition (if not previously done in same trial on step size).

4 Define matrix Rm using Equation (92-4) from IEEE 802.3 (if not previously done in same trial on step size).

5 Request to change the Tx setting to c(1) zero and c(0) and c(-1) to their minimum values.

6 Calculate linear fit pulse response.

7 Calculate coefficients with equation (92-5).

8 Calculate postcursor ratio (c(0) – c(1))/(c(0) + c(1)).

9 Report and compare the value calculated in the previous step with 4.

9 Return Loss PNA/ENA Measurements

This section provides the Methods of Implementation (MOIs) for the Return Loss Measurements using a Keysight Infiniium oscilloscope, PNA or ENA, and the 100GBASE-KR4 Test Application. The test application controls the PNA/ENA to set the test limits and run the test. You must ensure that the calibration must be done on the PNA/ENA.

NOTE

To prevent blank graphs / empty measurement screen-shots being displayed after test run in the HTML Report, it is recommended to use VNC for remotely controlling the PNA/ENA.

PNA - Performance Network Analyzer

ENA - Economy Network Analyzer

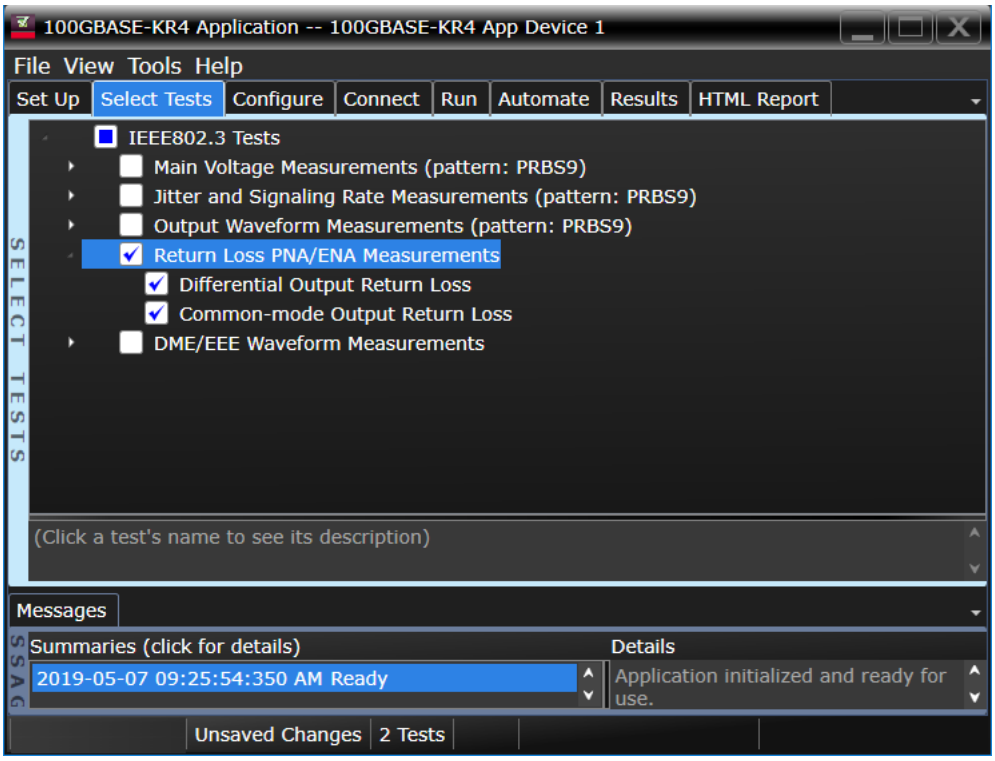


Figure 18 Tests under Return Loss Measurements

Limits for Return Loss PNA/ENA Measurements

The limits for tests under return loss PNA/ENA measurements can be found in various sections of IEEE 802.3 specification. Refer to Table 93-4 for corresponding values.

- Differential Output Return Loss (refer to section 93.8.1.4 and see Eq. 93-3)
- Common-mode Output Return Loss (refer to section 93.8.1.4 and see Eq. 93-4)

Measurement Algorithm (common for both tests)

1. Ensure that the PNA/ENA is physically connected and calibrated.
2. In the **Set Up** tab of the Test Application, click **Connect PNA** or **Connect ENA** to establish connectivity to the connected equipment.
3. Click the **Select Tests** tab and check the tests to measure the Return Loss Measurements.
4. Click **Run** under the **Run** tab. The Test Application automatically calculates the return loss.
5. Compare the reported values with the specification to check for compliance.

10 DME/EEE Waveform Measurements

DME Differential Peak-to-Peak Output Voltage Test 71
DME T1-Transition Position Spacing (Period) Test 72
DME T2-Clock Transition to Clock Transition Test 73
DME T3-Clock Transition to Data Transition Test 74
EEE Differential Peak-to-Peak Output Voltage Test with TX Disabled 75
EEE Differential Peak-to-Peak Output Voltage Test 76
EEE Common Mode Deviation Voltage Test 77

This section provides the Methods of Implementation (MOIs) for the DME and EEE Waveform Measurements using a Keysight Infiniium oscilloscope and the 100GBASE-KR4 Test Application.

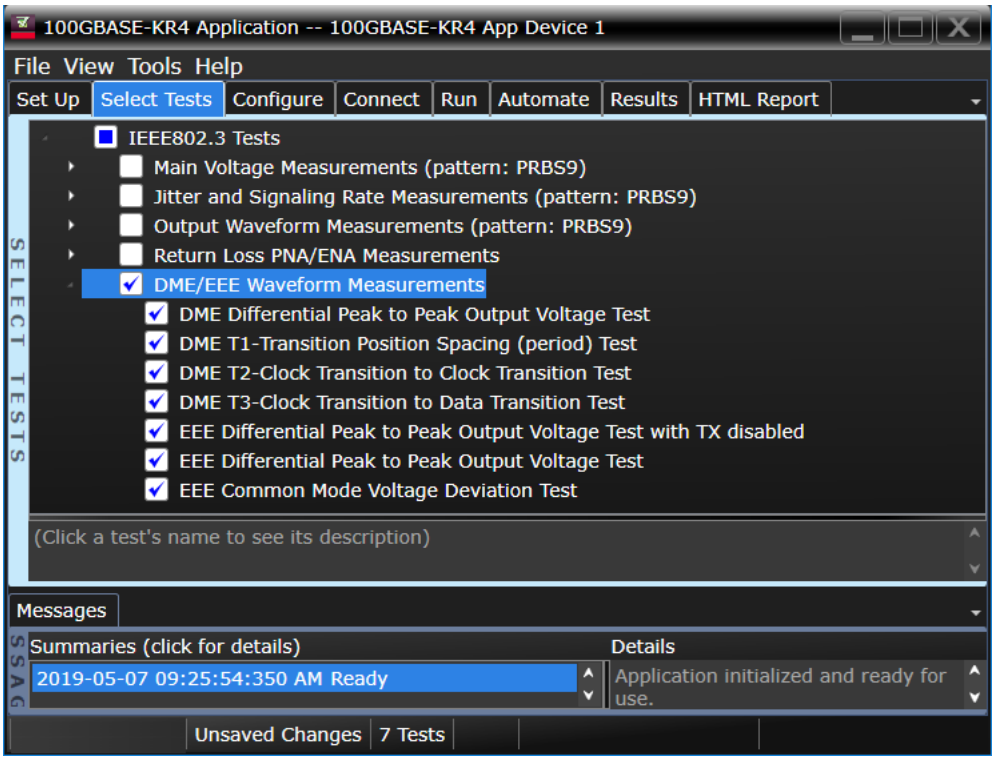


Figure 19 Tests under DME and EEE Waveform Measurements

Limits for DME/EEE Waveform Measurements

The limits for tests under DME/EEE Waveform measurements can be found in various sections of IEEE 802.3 specification. The 100GBASE-KR4 DME specifications can be found in IEEE 802.3ap-2012 section 73.5.1 Table 73-1 and section 73.5.3 Table 73-2. The 100GBASE-KR4 EEE specifications can be found in section 72.7.1 Table 72-6.

- DME Differential Peak-to-Peak Output Voltage (0.6-1.2 V).
- DME T1 (3.2 ns-0.01% to 3.2 ns+0.1%).
- DME T2 (6.2 ns-6.6 ns).
- DME T3 (3.0 ns-3.4 ns).
- EEE Differential Peak-to-Peak Output Voltage with TX disabled (max 30 mV).
- EEE Differential Peak-to-Peak Output Voltage with TX enabled (min 720 mV).
- EEE Common Mode Voltage Deviation (±150 mV).

DME Differential Peak-to-Peak Output Voltage Test

The purpose of this test is to verify that the peak-to-peak voltage of the differential signal on a 1010 pattern is less than 1200 mV.

PASS Condition

The differential signal max peak-to-peak voltage on a 1010 pattern is less than 1200 mV.

Measurement Algorithm

1 Obtain sample or acquire signal data.
2 Verify that there is a signal is connected and has a 1010 pattern.
3 Measure the peak-to-peak voltage of the differential signal of DUT+ and DUT-.
4 Compare the min and max peak-to-peak voltage to be within 0.6 to 1.2 V.

DME T1-Transition Position Spacing (Period) Test

The purpose of this test is to verify that transition spacing of the DME signal is 3.2 ns ±0.01%.

PASS Condition The mean period is between 3.2 ns ±0.01%.

Measurement Algorithm

1 Obtain sample or acquire signal data.
2 Verify that there is a signal is connected.
3 Set memory depth to capture the number or UI set in the configuration tab.
4 Request DUT in DME mode.
5 Measure the unit interval of the differential DME signal – set UI measurement to SEMI, 3.2e-9.
6 Compare the mean measurement to 3.2 ns ±0.01%.

DME T2-Clock Transition to Clock Transition Test

The purpose of this test is to verify clock to clock transition is 6.2 ns to 6.6 ns.

PASS Condition

The mean period is between 6.2 ns to 6.6 ns.

Measurement Algorithm

1 Obtain sample or acquire signal data.
2 Verify that there is a signal is connected.
3 Set memory depth to capture the number or UI set in the configuration tab.
4 Request DUT in DME mode.
5 Measure the rising to rising edge.
6 Compare the min and max values to measurement to 6.2 ns to 6.6 ns.

DME T3-Clock Transition to Data Transition Test

The purpose of this test is to verify clock to data transition is 3.0 ns to 3.4 ns.

PASS Condition The min and max UI time is between 3.0 ns to 3.4 ns.

Measurement Algorithm

1 Obtain sample or acquire signal data.
2 Verify that there is a signal is connected.
3 Set memory depth to capture the number or UI set in the configuration tab.
4 Request DUT in DME mode.
5 Measure the unit interval of the differential DME signal – set UI measurement to SEMI, 3.2e-9.
6 Compare the min and max values to measurement to 3.0 ns to 3.4 ns.

EEE Differential Peak-to-Peak Output Voltage Test with TX Disabled

The purpose of this test is to verify that when TX is disabled the peak-to-peak voltage is less than 30 mV.

PASS Condition

The max peak-to-peak voltage is less than 30 mV.

Measurement Algorithm

1 Obtain sample or acquire signal data.
2 Request DUT to be EEE mode.
3 Check that the signal is truly with TX disabled (no valid data transitions).
4 Measure peak-to-peak voltage of the signal.
5 Compare the max peak-to-peak voltage to 30 mV.

EEE Differential Peak-to-Peak Output Voltage Test

The purpose of this test is to verify that the peak-to-peak voltage of the differential signal on a 1010 pattern is greater or equal to 720 mV.

PASS Condition

The differential signal max peak-to-peak voltage on a 1010 pattern is greater than or equal to 720 mV.

Measurement Algorithm

1 Obtain sample or acquire signal data.
2 Request DUT in EEE mode.
3 Verify that there is a signal is connected and has a 1010 pattern.
4 Measure the peak-to-peak voltage of the differential signal of DUT+ and DUT-.
5 Compare the min voltage to be greater than or equal to 720 mV.

EEE Common Mode Deviation Voltage Test

The purpose of this test is to verify that the common mode signal of the differential pair of the pre-LPI signal and the LPI signal is within ±150 mV.

PASS Condition The signal voltage change between pre and post LPI is within 150 mV change.

Measurement Algorithm

1 Obtain sample or acquire signal data.

2 Verify that there is a signal and that the connection is dual-single ended.

3 Request DUT to be pre-LPI.

4 Measure the peak-to-peak voltage.

- If the Test Application is running on the DSO Oscilloscope, the **Instrument Setup** is preset to **Real Edge**.
- If the Test Application is running on the UXR Oscilloscope, perform the measurement with the **Instrument Setup** set to **Channels 1 and 2**. Repeat the measurement with the **Instrument Setup** set to **Channels 3 and 4**.

5 Request DUT to be in LPI.

6 Measure the peak-to-peak voltage again.

- If the Test Application is running on the DSO Oscilloscope, the **Instrument Setup** is preset to **Real Edge**.
- If the Test Application is running on the UXR Oscilloscope, perform the measurement with the **Instrument Setup** set to **Channels 1 and 2**. Repeat the measurement with the **Instrument Setup** set to **Channels 3 and 4**.

7 Calculate Vpp(post)-Vpp(pre).

8 Compare the result from step 8 to ±150 mV.

11 Exporting Measurement Results to Repository

Uploading Results to Repository 80

Uploading Results to Repository

The Upload Results To Repository feature is an add-on to the Keysight Test Application, where it expands the boundaries of storing and analyzing the measurement results to a wider audience, who may be based in multiple sites across various geographical locations. Along with the feature of exporting test results from the Test Application into your local disk in a CSV or HTML file format, you have the option to upload the test results to a Dataset on a Web Repository. Based on your requirements, you may either upload only a single measurement trial or upload huge volumes of measurement results to any Dataset.

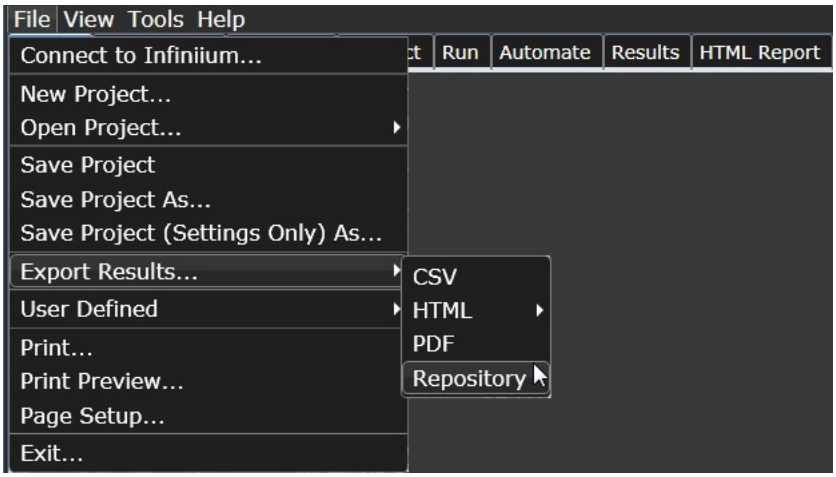
Not only can remote users with an active Internet connection access these Datasets and the corresponding test results on the Web Repository, but they have the option to add and delete Datasets on the Web Server. In the Upload Results To Repository feature, you can even modify the Dataset properties, which are helpful especially when performing a graphical analysis of the uploaded data.

In combination with the *Keysight KS6800A Series Analytics Software*, the Upload Results To Repository feature provides a comprehensive solution to export, view and perform analysis of the measurement results, thereby resulting in qualitative data to ensure that the Device Under Test (DUT) is compliant to the industry standards.

Refer to the *Keysight KS6800A Series Analytics Software Online Help* for more information about the functionality of various features in this software.

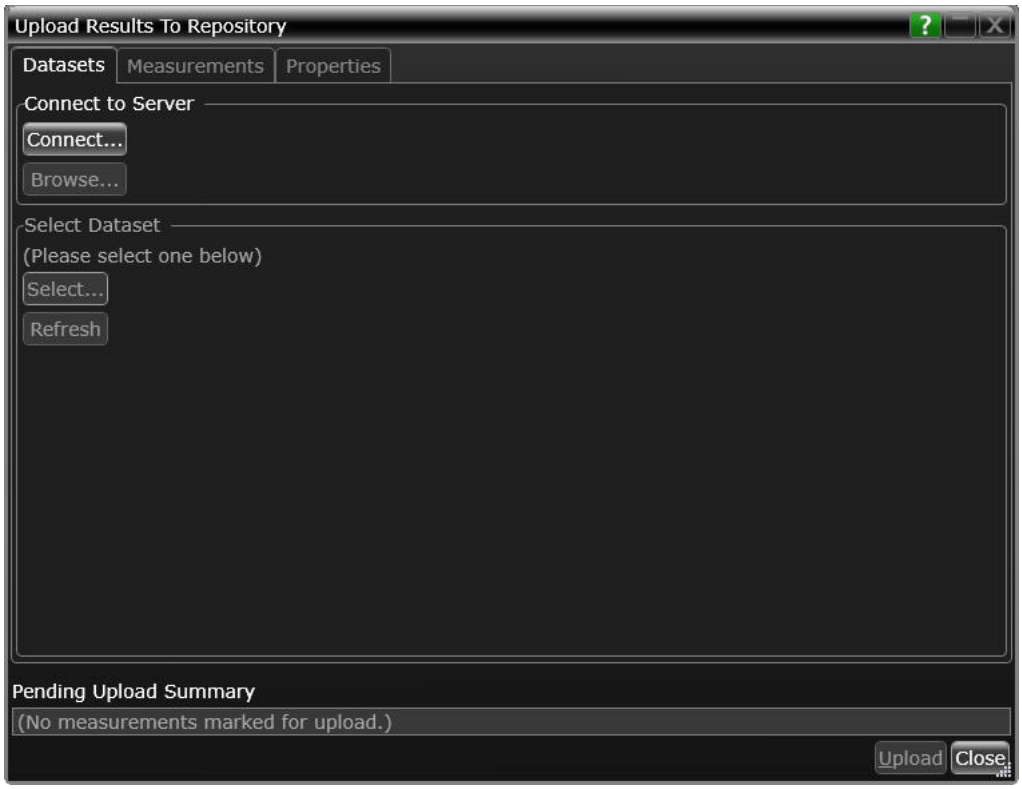
To export measurement results to the Repository after the completion of test runs,

1 From the Test Application's main menu, click **File > Export Results... > Repository**.



The **Upload Results to Repository** window appears.

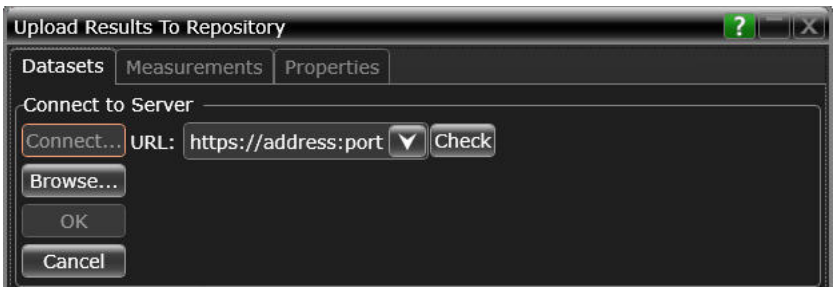
2 In the **Connect to Server** pane of the **Datasets** tab, click **Connect...** to login to the Dataset Repository server.



3 In the URL: drop-down text field that appears, replace the default text with the actual IP address or the URL along with the port number, if applicable.

You may enter the URL of the Web Repository server, which may be a self-hosted server on your machine (http://localhost:5000/), a remote server or an authentication server. Note that all such URLs accessed via this window appear as a drop-down list in the URL: field.

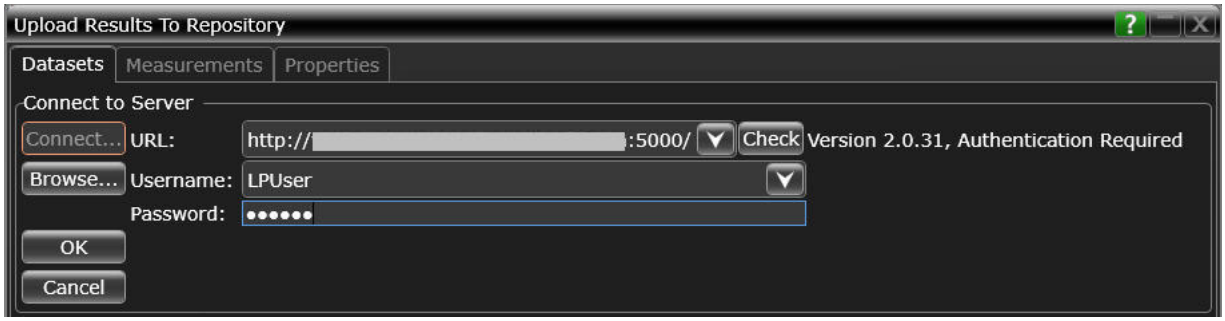
4 Click the Check button to verify that the KS6800A Series Analytics service is available on the specified web address. Repeat this step each time you edit the web address.



- For unrestricted access to the Repository
  - *a* If the server does not require authentication and the KS6800A Series Analytics service is found on the specified web address, the version information is displayed adjacent to the Check button.

  - *b* If you click OK, the Upload Results to Repository window displays the connectivity status to the Dataset Repository.
  - *c* Click Browse... to navigate directly to the URL.

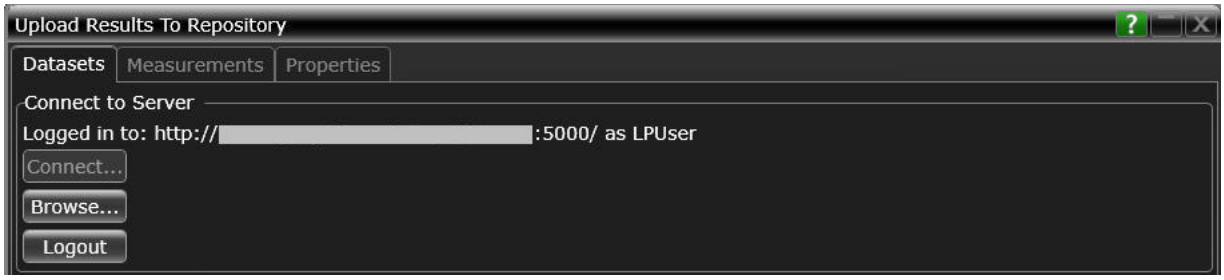
- For restricted access to the Repository
  - *a* If service is found on the specified URL but access to the web server is restricted based on authentication, the version information is displayed along with the text Authentication Required adjacent to the Check button. Also, the Username: and Password: fields appear. The OK button remains disabled until the authentication credentials are entered.
  - *b* Enter the user credentials in the respective fields, which are required for authentication to access those Datasets that have been created on the web server you are connecting to. For each URL that you access, the Username: drop-down box keeps a record and displays all user names used to access the respective URL.



c Click OK to connect to the entered URL/IP address.

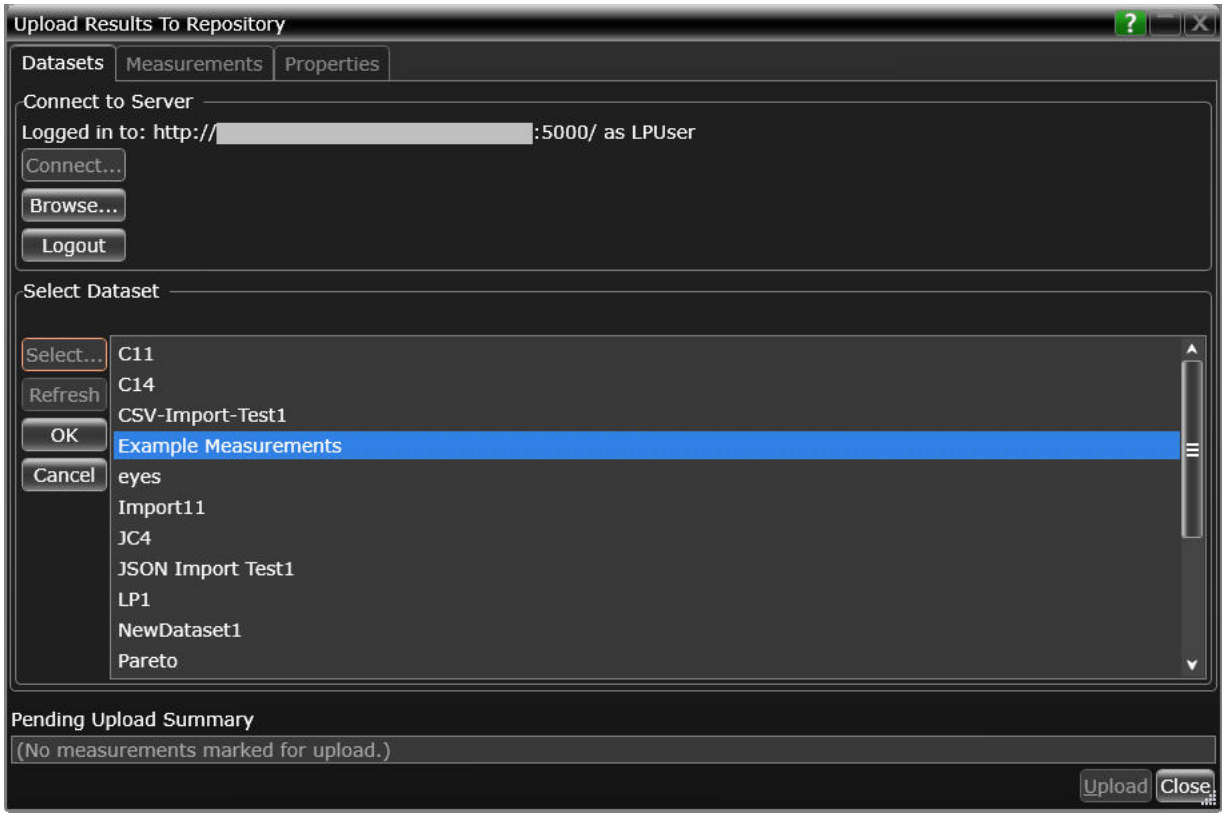
The Connect to Server area displays the connection status along with the username.

d Click Browse... to navigate directly to the URL.

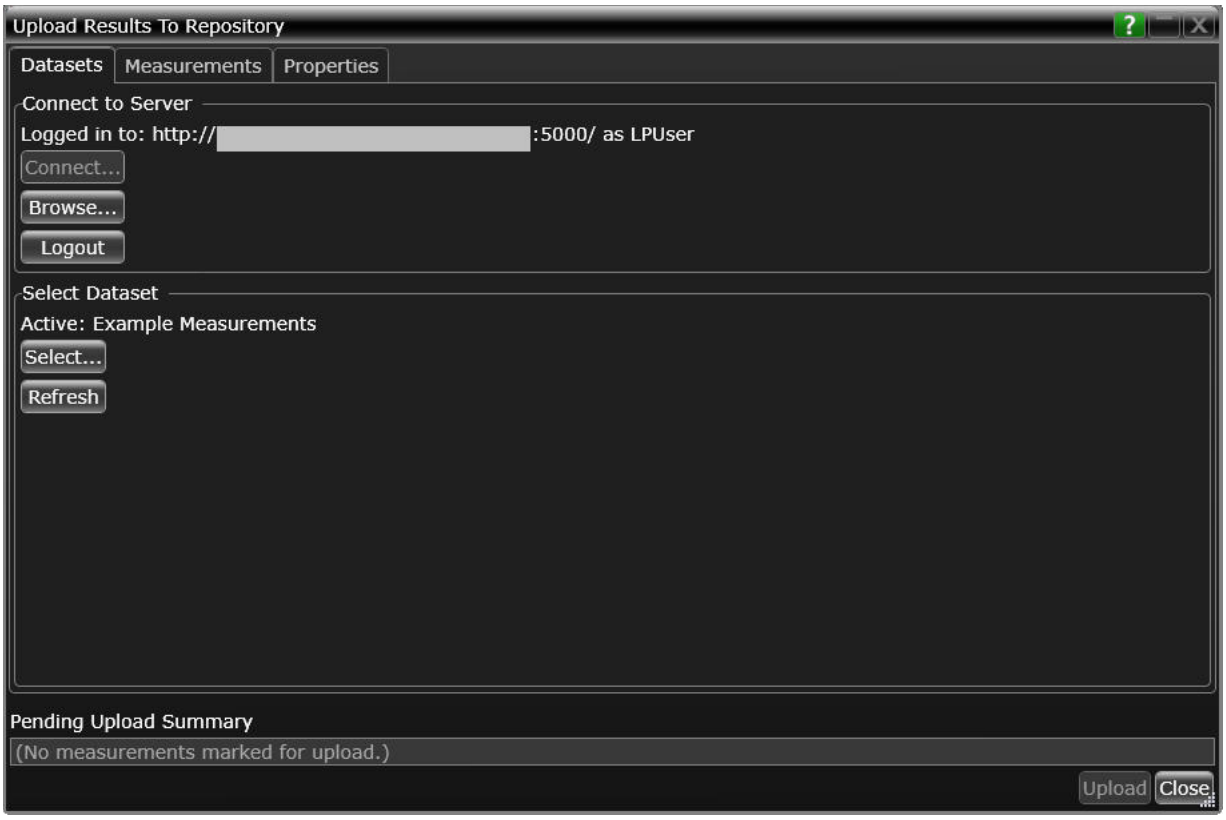


5 In the Select Dataset area, click Select... to view the list of Datasets created on the connected repository. Click Refresh to update the list of Datasets that appear in the Test Application's user interface.

6 Select the Dataset name where you wish to upload measurement results to. Click OK.

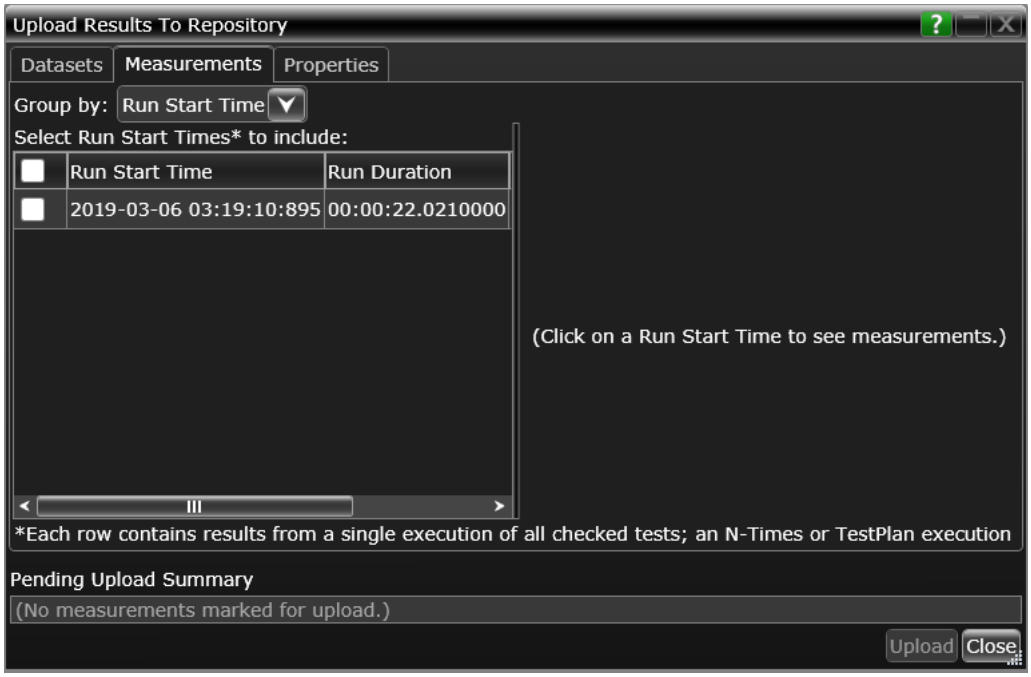


The Select Dataset area displays the selected Dataset as Active. The Measurements and Properties tabs are enabled after a Dataset is selected.



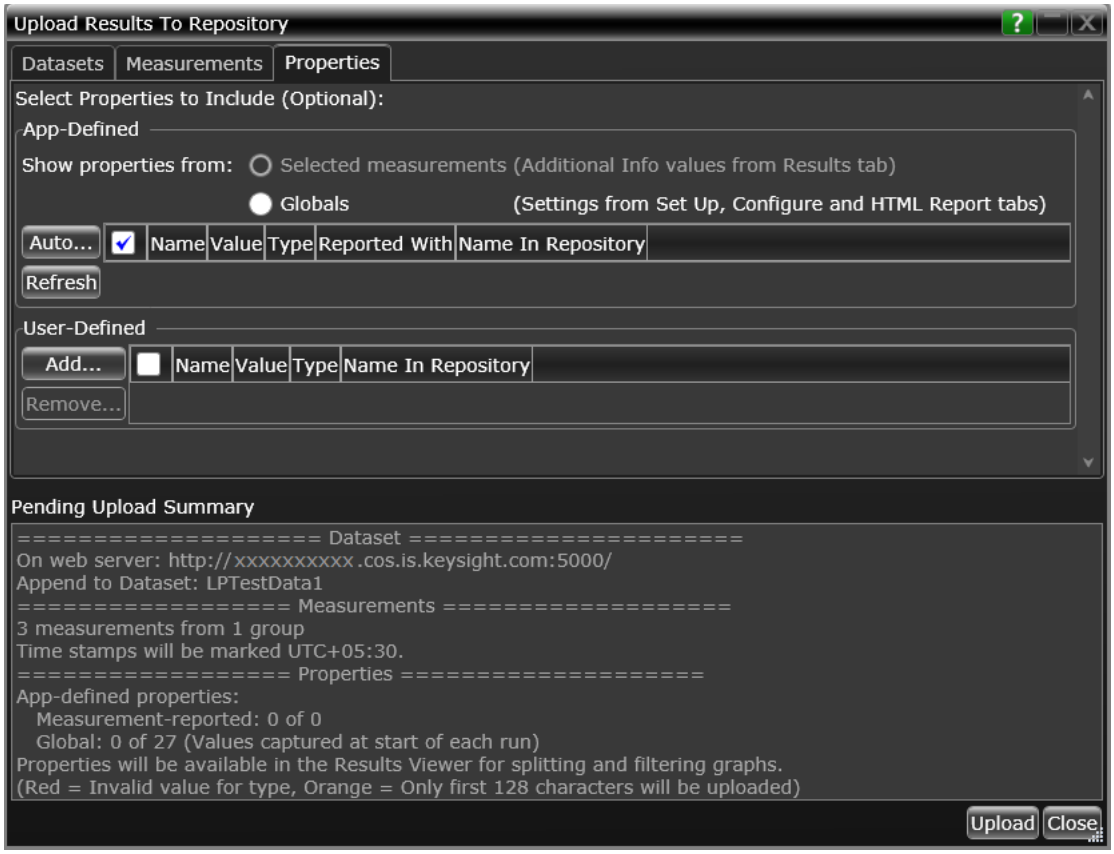
7 Click the **Measurements** tab where the test results from the last test run are displayed.

8 You may select and export multiple test results to the repository. You may change the format for the display of measurement data using the drop-down options in the **Group by:** field.

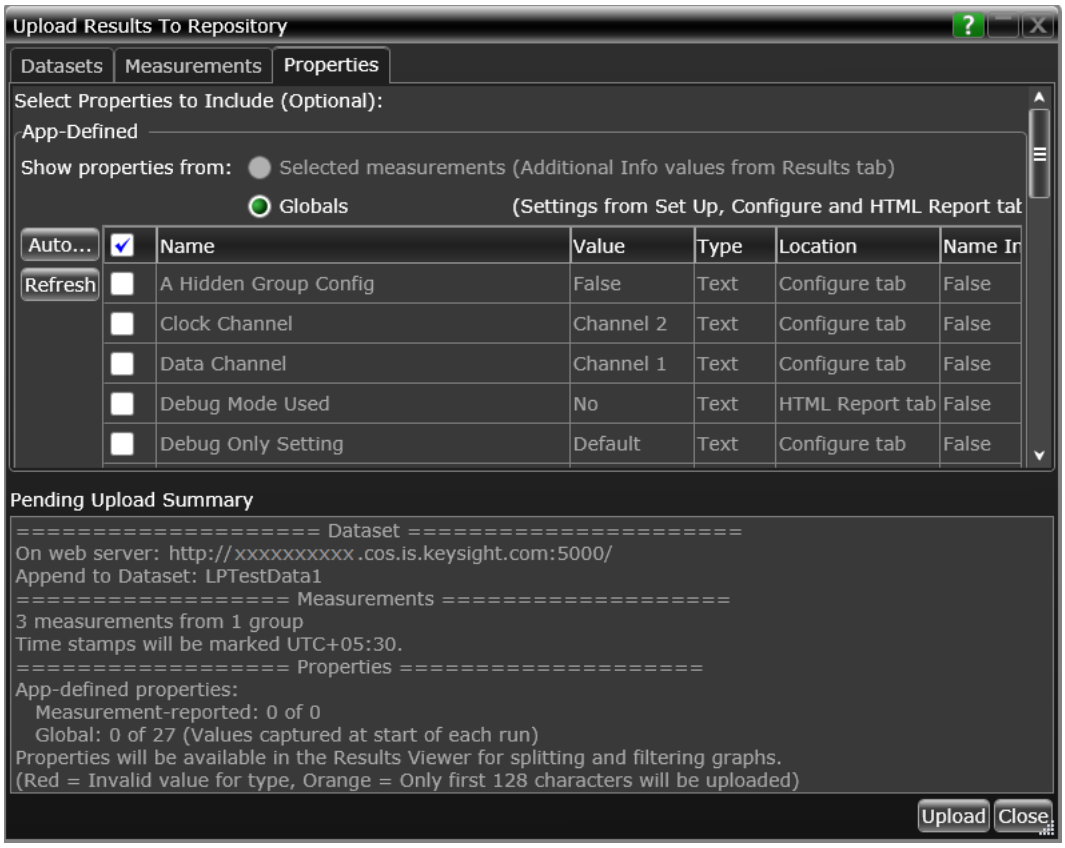


9 After selecting one or more measurements, either click **Upload** or switch to the **Properties** tab to associate one or more properties to the measurements that are being uploaded to the Web Server.

To perform an enhanced analysis on the measurement data using the *KS6800A Series Analytics Service Software*, Keysight recommends assigning properties to the measurements.



10 Click the **Properties** tab to assign properties for your measurement results that you select to upload. By default, the **App-Defined** properties are selected to be uploaded in association with the measurement data, wherein only certain aspects of the selected measurements are uploaded. However, you may switch to **Globals** to include as properties one or more options configured under the rest of the tabs of the Compliance Test Application or define one or more custom property values to be associated with the selected measurement data.



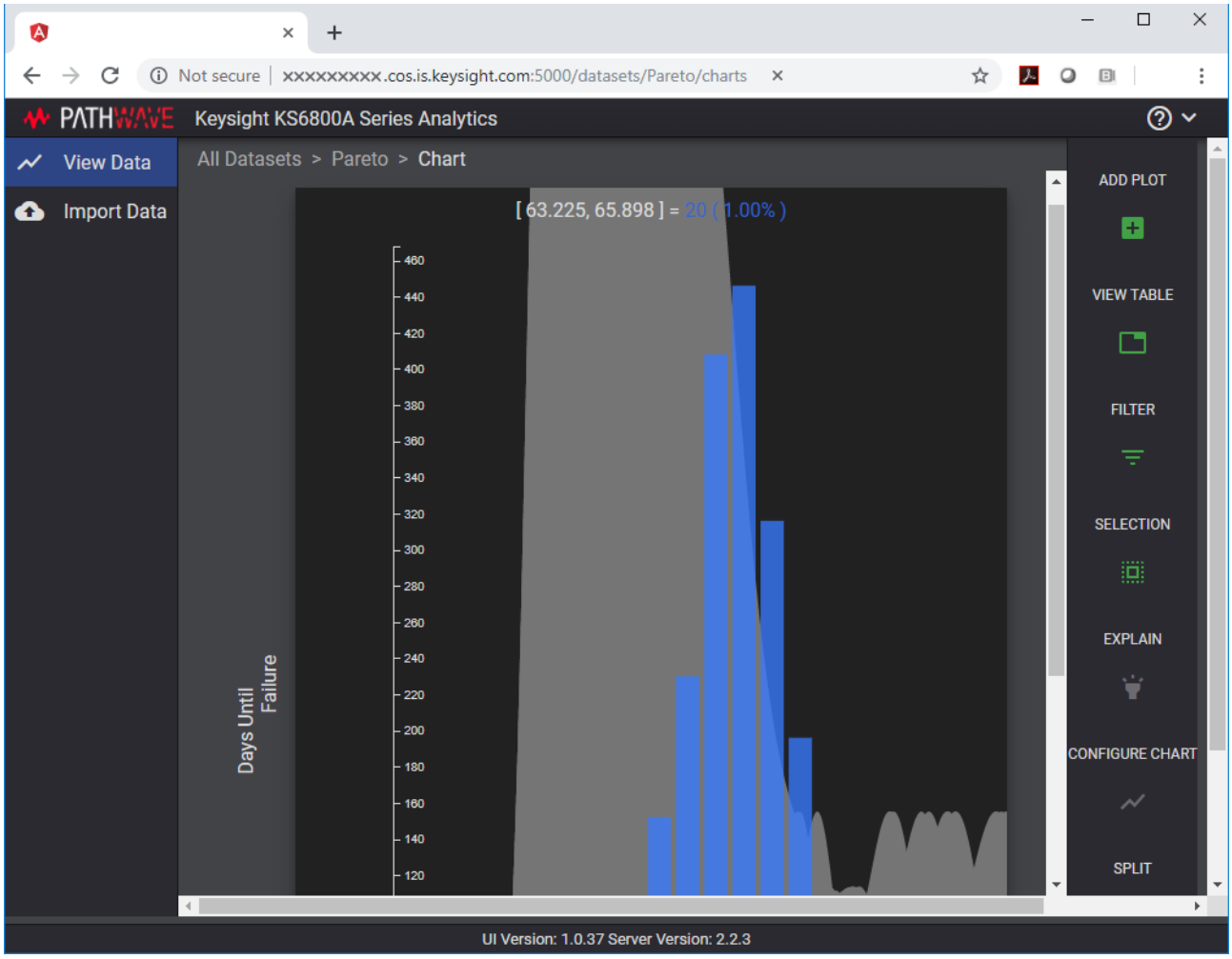
11 Click **Upload** to begin uploading measurement results.

12 Click **Close** to exit the **Upload Results to Repository** window and to return to the Compliance Test Application.

You may access the Dataset Repository using the Internet browser on your machine to view the measurement results graphically on the *KS6800A Series Analytics Service Software*.

KS6800A Series Analytics Service Software

The KS6800A Series Analytics Service software supports multiple data sources and also a wide range of data import clients. This web-based software provides various types of charts, such as Histogram, Box-and-Whisker, Line, Scatter, Eye Diagram and Constellation, each with split capability to enable data analysis. Once you upload the measurement results to a Dataset on the *KS6800A Series Analytics Service Software* via the **Upload Results to Repository** window of the Test Application, the measurement results can be viewed graphically as shown below:



For more information on the Data Analytics Web Service Software, visit KS6800A Series Analytics Service Software page on the Keysight website. You may refer to the Help manual provided within the software to understand the functionality of its features.

12 Debug Mode

Debug mode can be selected to make enable the ability to change jitter measurement options. In the **Configuration** tab, select the **Debug** radio button. This will add the following options:

- **Rj Bandwidth** – Choose the Rj Filter. Options are Narrow (Pink) or Wide (White). This changes the amount of DC jitter in the Rj measurement.
- **Jitter Pattern Length** – Choose Periodic or Arbitrary. Periodic is used for data patterns that are periodic and repeat through the scope memory. Arbitrary is used for random data patterns or long data patterns (for example, PRBS31) that do not repeat through the scope memory. If Arbitrary is selected, set the ISI filters.
- **ISI Filter Lead** – When using Arbitrary mode for the Jitter Pattern Length, set the Leading ISI filter coefficient. To help select the correct ISI filter, see Application Note 1574: Choosing the ISI Filter Size for EZJIT Plus Arbitrary Data Jitter Analysis (at www.keysight.com, literature part number 5989-4974EN).
- **ISI Filter Lag** – When using Arbitrary mode for the Jitter Pattern Length, set the Lagging ISI filter coefficient. Again, to help select the correct ISI filter, see Application Note 1574: Choosing the ISI Filter Size for EZJIT Plus Arbitrary Data Jitter Analysis.

Index

A

AC Common Mode Output Voltage Test, 43
application software, installing, 12
application software, starting, 19
Automation tab, 23

B

bounded uncorrelated jitter, 48

C

calibrating the oscilloscope, 18, 28

D

data rate, 47
data rate and jitter measurements, 45
DC Common Mode Output Voltage Test, 42
Debug Mode, 89
Differential Peak-to-Peak Output Voltage Test, 44
Differential Peak-to-Peak Output Voltage Test with TX Disabled, 41
DME Differential Peak-to-Peak Output Voltage Test, 71
DME T1-Transition Position Spacing (Period) Test, 72
DME T2-Clock Transition to Clock Transition Test, 73
DME T3-Clock Transition to Data Transition Test, 74
DME/EEE waveform measurements, 69
DME/EEE waveform specifications, 70

E

EEE Common Mode Deviation Voltage Test, 77
EEE Differential Peak-to-Peak Output Voltage Test, 76
EEE Differential Peak-to-Peak Output Voltage Test with TX Disabled, 75
even-odd jitter, 48

F

full scale range measurements, 63

I

installation, 7, 11
ISI Filter Lag, 89
ISI Filter Lead, 89

J

jitter, 48
jitter and data rate measurements, 45
Jitter Pattern Length, 89

L

license key, installing, 13
Linear Fit Pulse Peak, 52, 53

M

main voltage measurements, 39
main voltage specifications, 40
measurements, preparing, 17, 79
Minimum Post-cursor Full-scale Test, 66
Minimum Pre-cursor Full-scale Test, 65
mouse, 9

N

Normalized Coefficient Step Size c(1) dec c(0) hold c(-1) hold, 58
Normalized Coefficient Step Size c(1) hold c(0) dec c(-1) hold, 60
Normalized Coefficient Step Size c(1) hold c(0) hold c(-1) dec, 62
Normalized Coefficient Step Size c(1) hold c(0) hold c(-1) inc, 61
Normalized Coefficient Step Size c(1) hold c(0) inc c(-1) hold, 59
Normalized Coefficient Step Size c(1) inc c(0) hold c(-1) hold, 57
normalized coefficient step size measurements, 55

O

oscilloscope calibration, 18, 28

R

random jitter, 48
Results tab, 23
return loss ENA/PNA measurements, 67
Rj Bandwidth, 89
Run Tests tab, 23

S

Set Up tab, 23
specifications, DME/EEE waveform, 70
specifications, main voltage, 40
specifications, transmitter output, 46, 50
Steady State Voltage Vf, 51

T

transmitter output specifications, 46, 50
transmitter output waveform measurements, 49