TekExpress® DisplayPort 2.1 Automated Solution

Application Help

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077-1708-03 July 2026

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Worldwide, visit www.tek.com to find contacts in your area.

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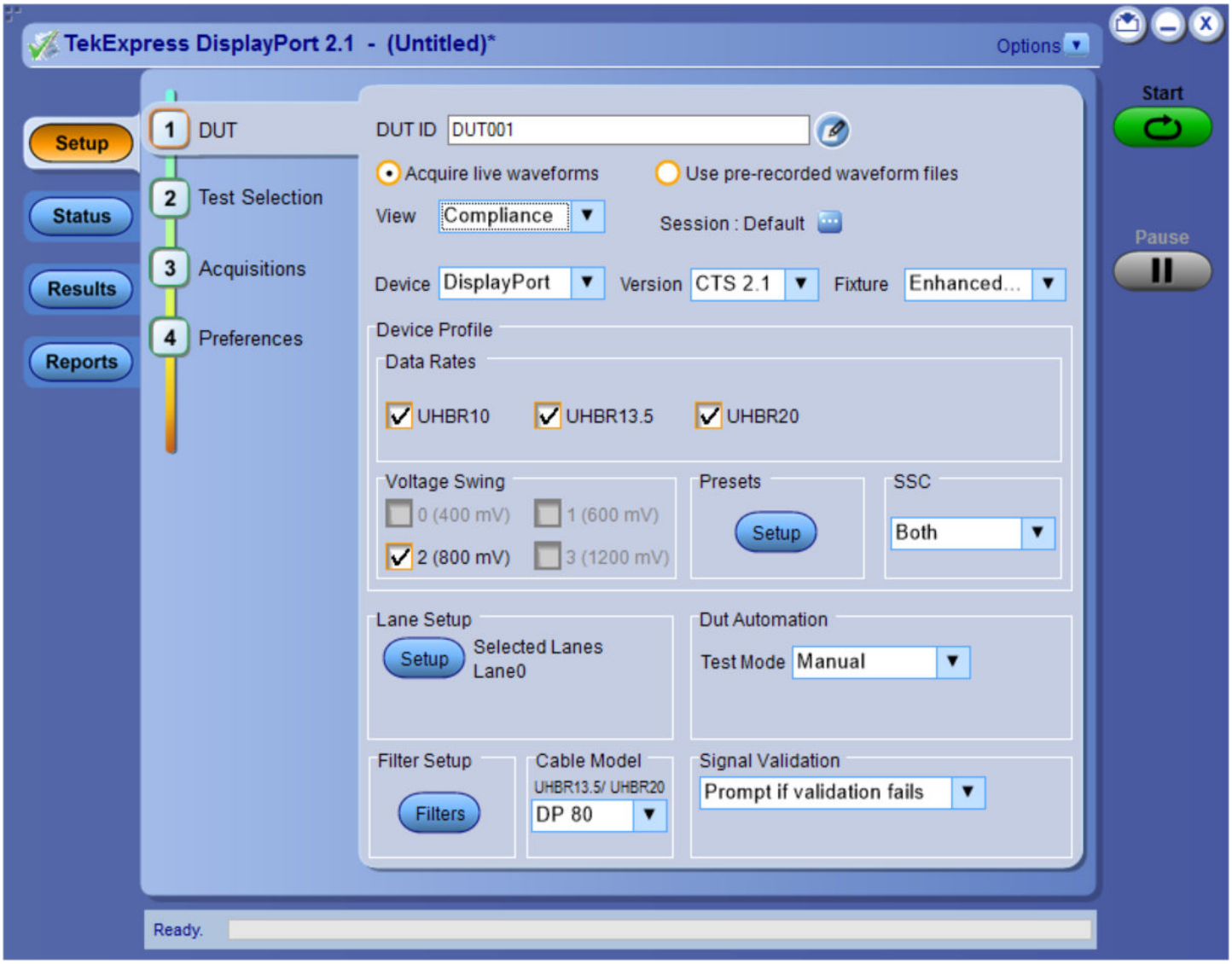
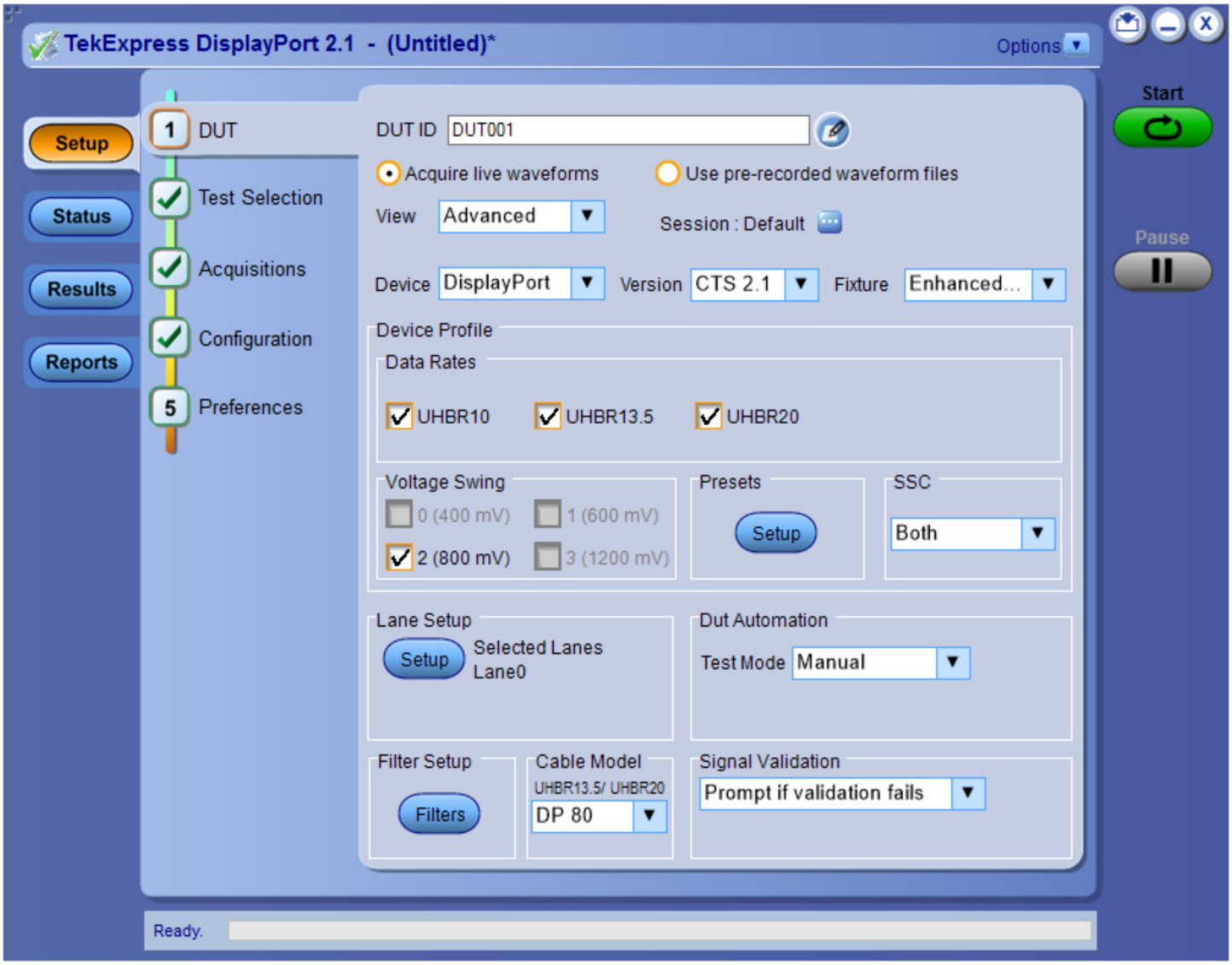
Welcome



Setup panel with compliance view



Setup panel with advanced view

Key features

Comprehensive DisplayPort 2.1 compliance testing

- Supports complete compliance testing for UHBR10, UHBR13.5, and UHBR20 data rates.
- Compatible with DisplayPort 2.1 source devices using enhanced DisplayPort, Type-C, and mDP fixtures.
- Supports all normative and informative measurements defined in the DisplayPort 2.1 Compliance Test Specification (CTS).

Signal preset and equalization testing

- Supports P0 to P15 presets for signal test.
- Supports TX Preset Equalization testing across all supported data rates.
- Supports testing at both TP2 and TP3_EQ compliance test points.
- Enables simultaneous analysis of TP2 and TP3_EQ test points in a single test run.
- Uses Serial Data Link Analysis (SDLA) for TP3_EQ test-point analysis.
- Includes preset optimization, which identifies the optimal presets independently for TP2 and TP3_EQ at each data rate.

Advanced channel modeling and de-embedding

- Supports P7625 and P7633 differential probes.
- Provides fixture de-embedding in differential and single-ended mode by creating a custom filter file using SDLA software to leverage channel modeling and receiver equalization functionality.

Test automation

- Supports DUT toggle automation using the Unigraf UCD-323 device.
- One-click selection of multiple tests for faster execution.
- Supports saved test setups, eliminating repetitive configuration steps.
- Enables multi-lane testing in a single run.
- Allows simultaneous testing of multiple data rates, TX presets, and test points.
- Allows configuration of Spread Spectrum Clocking (SSC) mode: SSC On, SSC Off, and Both.

Signal validation and offline analysis

- Includes signal validation to detect waveform anomalies before compliance analysis.
- Supports pre-recorded mode for offline analysis of previously captured waveforms.

Comprehensive reporting

- Generates detailed compliance reports with:
  - Pass/Fail summary tables
  - Compliance status reporting
  - Measurement limits and margin information
  - Feature-wise grouped results
  - Consolidated test summaries
- Supports export formats: PDF, MHT, and CSV.
- Provides advanced post-processing and data analysis.
- Provides one-click report format conversion.

Debug and characterization support

- Includes the DisplayPort 2.0 DPOJET plug-in solution with MOI and setup files.
- Supports debugging, characterization, and root-cause analysis workflows.
- Utilizes optimized test algorithms to improve measurement accuracy and execution efficiency.

Getting help and support

Product documents

Use the product documents for more information on the application functions, understand the theory of operation, how to remotely program or operate the application, and do other tasks.

TekExpress Application documents

To learn about	Use this document
How to use the application How to remotely control the instrument	TekExpress Display Port 2.1 Help PDF version can be downloaded from www.tek.com. Compiled HTML (CHM) version is integrated with the application. Press F1 key from the keyboard to start the help. Tektronix Part Number: 077-xxxx-xx

Conventions

This application help uses the following conventions:

- The term "Application," and "Software" refers to the TekExpressApplication.
- The term “DUT” is an abbreviation for Device Under Test.
- The term “select” is a generic term that applies to the two methods of choosing a screen item (button control, list item): using a mouse or using the touch screen.
- A **Note** identifies important information.

Icons used in the help

Icon	Description
	This icon identifies important information
	This icon identifies conditions or practices that could result in loss of data.
	This icon identifies additional information that will help you use the application more efficiently.

Technical support

Tektronix values your feedback on our products. To help us serve you better, please send us your suggestions, ideas, or comments on our application or oscilloscope. Contact Tektronix through mail, telephone, or the Web site. See Contacting information (on page 2) at the front of this document for contact information.

When you contact Tektronix technical support, please include the following information (be as specific as possible):

General information

- All instrument model numbers
- Hardware options, if any
- Modules used
- Your name, company, mailing address, phone number, FAX number
- Please indicate if you would like to be contacted by Tektronix about your suggestion or comments.

Application specific information

- Software version number
- Description of the problem such that technical support can duplicate the problem
- If possible, save the setup files for all the instruments used and the application
- If possible, save the TekExpress setup files, log.xml, *.TekX (session files and folders), and status messages text file

Getting started

Hardware requirements

Compatibility

The TekExpress DisplayPort Tx application runs on the following Tektronix oscilloscopes:

- DPO/MSO72304DX/72504DX/73304DX Series Digital Oscilloscopes
- DPO72304SX, DPO72504SX, DPO73304SX, DPO75002SX, DPO75902SX, DPO77002SX, DPS75004SX, DPS75904SX, and DPS77004SX

See Also

Minimum system requirements (on page 11)

Minimum system requirements

The following table shows the minimum system requirements for an oscilloscope to run TekExpress.

System requirements

Component	Requirement
Oscilloscope	DPO70000DX/SX series oscilloscopes with bandwidth ≥ 21 GHz for UHBR data rates in compliance mode. For list of compatible oscilloscopes, see Compatibility (on page 11).
Processor	Same as the oscilloscope
Operating System	Same as the oscilloscope (Windows 10)
Memory	Same as the oscilloscope
Hard Disk	Same as the oscilloscope
Display	Same as the oscilloscope
Software	▪ DPOJET, Jitter and Eye Diagram Analysis Tool, v10.6.0. or later ▪ Microsoft Internet Explorer 11.0 SP1 or later ▪ Microsoft Photo Editor 3.0 or equivalent software for viewing image files ▪ Adobe Reader 7.0 or equivalent software for viewing portable document format (PDF) files ▪ SDLA software v3.0.13.62 or later for performing equalization of CTLE indices.
Probes	TCA-SMA single-ended OR P76xx Tri-Mode probe with Probe tip: P76CA-292, P76CA-292C, P76CASMP, and P76TA
Other devices	▪ Microsoft compatible mouse or compatible pointing device ▪ Four USB ports (two USB ports minimum)

Component	Requirement
Accessories	▪ Min 1x PMCABLE1M Phase matched cable pair, if you are using TCA-SMA probes. ▪ Min 2x SM8852 (Fairview Microwave) SMA to SMP adapter, if you are using TCA-SMA Probes.

See Also

Compatibility (on page 11)

Supported probes

The table provides the list of probes recommended for the DisplayPort 2.1 application.

Recommended Probe model
7625,7633 differential probe based input, which offers the most efficient test configuration, by offering inputs for all 4 differential DisplayPort signals concurrently. This configuration precludes the testing of common mode and skew measurements.
TCA-based single-ended input (direct Tektronix oscilloscope inputs) supports both differential and single-ended tests.

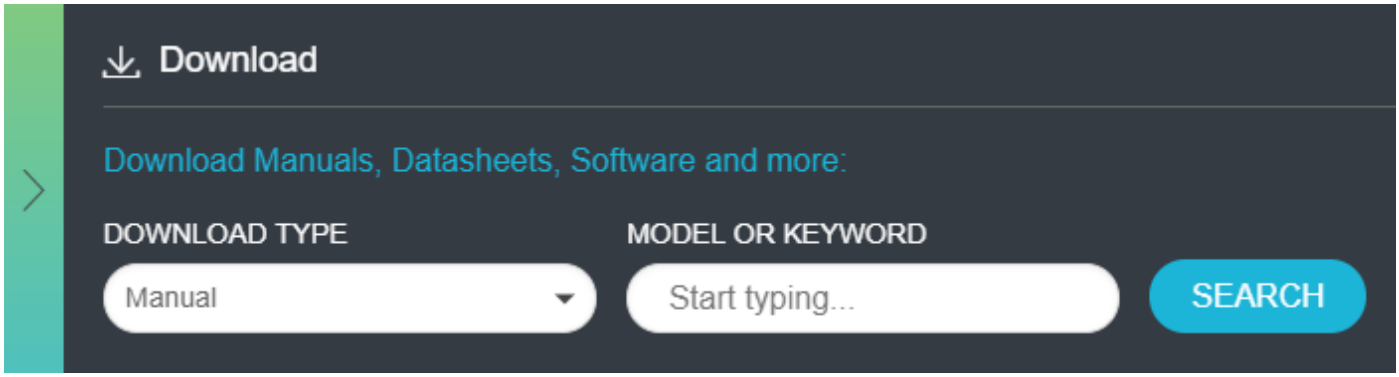
Software requirements

This section briefly describes the system requirements needed to install the application.

Downloading and installing the software

Complete the following steps to download and install the latest TekExpress Display Port 2.1 application.

1. Go to www.tek.com.
2. Click **Downloads**. In the Downloads menu, select DOWNLOAD TYPE as Software and enter the application name in the MODEL OR KEYWORD field and click **SEARCH**.



3. Select the latest version of software and follow the instructions to download the software. Copy the executable file into the oscilloscope.
4. Double-click the executable and follow the on-screen instructions.

   The software is installed at `C:\Program Files\Tektronix\TekExpress\TekExpress` .
5. Select **TekExpress Application > TekExpress** from the Oscilloscope menu, to open the application.

Activate the license

To activate the license, access the oscilloscope's help documentation, navigate to the License Activation section, and follow the on-screen instructions using the oscilloscope interface.

Check Software Version and License Agreement

To view version information of the application, click **Options > About TekExpress**.

Setting up the test environment

About setting up tests

Setup the tests by using the tabs in the Setup panel: Configure the test setup (on page 30). Settings in the DUT tab use a top-down, left-to-right logic flow, so that any parameter that affects or acts as a filter for other parameters appears either to the top of or to the left of the affected parameters.

Test options include two views, Compliance and Advanced (selected in the DUT tab of the Setup panel), with Compliance Mode (selected in the Configuration Setup panel). The selected view determines where the test configuration settings are displayed. The level of user intervention required depends on the DUT Automation setting and Acquisition parameters.

- **Compliance View** selected with **Compliance Mode**: View configuration options in the Test Selection tab of the Setup panel. Tests will run automatically with little or no user intervention. You will not be able to change test parameters to anything that deviates from the compliance standards. The only test configuration parameters that you can change in this mode are the Real Time Scope and the Digital Filters (DSP), both under Global Settings.
- **Advanced View** selected with **Compliance Mode**: View configuration options in the Configuration tab of the Setup panel. Tests will run automatically with little or no user intervention. You will not be able to change test parameters to anything that deviates from the compliance standards. The only configuration parameters you can change in this mode are the selected Real Time Scope, Cable filters for Eye diagram test, and the Digital Filters (DSP) under Global Settings.

Supported tests

- Eye Diagram Testing - An eye diagram is an indicator of quality in a serial bit stream. The display (which has symmetrical patterns shaped similarly to eyes, hence the name) represents the integrity and consistency of data streams by visualizing the transitions between 0 and 1 values and comparing those transitions among the others in their stream.
  - Test Points: TP2, TP3_EQ
  - Pattern: PRBS31
- Data Dependent Jitter (DDJ) Measurement - DDJ is threshold-crossing time deviations correlated to the previous bits on the current data bit.
  - Test Points: TP2, TP3_EQ
  - Pattern: PRBS15
- Random Jitter (RJ) Measurement - Random Jitter (RJ) is also called Gaussian jitter, is unpredictable electronic timing noise. Random jitter typically follows a normal distribution.
  - Test Points: TP2, TP3_EQ
  - Pattern: PRBS15
- Total Jitter (TJ) Measurement - Total Jitter (TJ) is the sum of random and deterministic jitter and is calculated for a specific BER for the system.
  - Test Points: TP2, TP3_EQ
  - Pattern: PRBS15

- Uncorrelated Jitter (UJ) Measurement - Jitter that is bounded and correlated to the data is "Data dependent jitter" (DDJ). Removing DDJ from Deterministic Jitter is Uncorrelated Jitter.
  - Test Points: TP2, TP3_EQ
  - Pattern: PRBS15
- Uncorrelated Deterministic Jitter (UDJ) Measurement - Deterministic Jitter (DJ) is a type of clock or data signal jitter that is predictable and reproducible. The peak-to-peak value of this jitter is bounded, and the bounds can easily be observed and predicted. Deterministic jitter has a known non-normal distribution. Deterministic jitter can either be correlated to the data stream (data-dependent jitter) or uncorrelated to the data stream (bounded uncorrelated jitter). UDJ measures uncorrelated jitter which is Bounded in nature. The most common cause of UDJ is crosstalk.
  - Test Points: TP2, TP3_EQ
  - Pattern: PRBS15
- Low Frequency Uncorrelated Deterministic Jitter (LFUDJ) Measurement - Low Frequency UDJ measurement calculates deterministic jitter after removal of data dependent jitter on low frequency signal.
  - Test Points: TP2, TP3_EQ
  - Pattern: PRBS15
- SSC Down Spread Rate Measurement – This measurement calculates computes the SSC modulating frequency.
  - Test Points: TP2
  - Pattern: PRBS31
- SSC Phase Deviation Measurement - This measurement calculates SSC phase deviation in Seconds, measured at each inflection point in the modulation profile.
  - Test Points: TP2
  - Pattern: PRBS31
- SSC Spread range Measurement - This measurement calculates the SSC Spread range.
  - Test Points: TP2
  - Pattern: PRBS15
- SSC Slew Rate Measurement - This measurement calculates rate of change SSC frequency deviation in ppm (parts per million), measured at each inflection point in the modulation profile. It is expressed in kppm/us.
  - Test Points: TP2
  - Pattern: PRBS31
- Unit Interval Measurement - Unit Interval measurement calculates period. For clock signals, the elapsed time between consecutive crossings of the mid reference voltage level in the direction specified; one measurement is recorded per crossing pair.
  - Test Points: TP2
  - Pattern: PRBS31
- Bit Rate Measurement - Bit Rate is reciprocal of UI. UI is calculated dynamically using a uniform moving average filter procedure.
  - Test Points: TP2
  - Pattern: PRBS31
- AC Common Mode Measurement - This test shall evaluate the DP UHBR Source AC common mode (ACCM) noise (unfiltered rms) of the differential data line of a DP interface.
  - Test Points: TP2
  - Pattern: PRBS15

- Preset Optimization Measurement- Preset Optimization Measurement is used to find out the optimal preset value. For TP2 test point it is the preset that gives the least DDJ. For TP3_EQ it is the preset that gives the largest eye area after applying the CTLE+DFE.
  - Test Points: TP2, TP3_EQ
  - Pattern: PRBS15 (TP2), PRBS31(TP3_EQ)
- Transmitter Equalization test - Transmitter Equalization test is used to calculate Preshoot, Deemphasis and Swing, where preshoot, deemphasis and swing are the ratio of voltages for different DUT configuration.
  - Test Points: TP2
  - Pattern: SQ128

See Also

Before you click start (on page 21)

Deskew channels (on page 139)

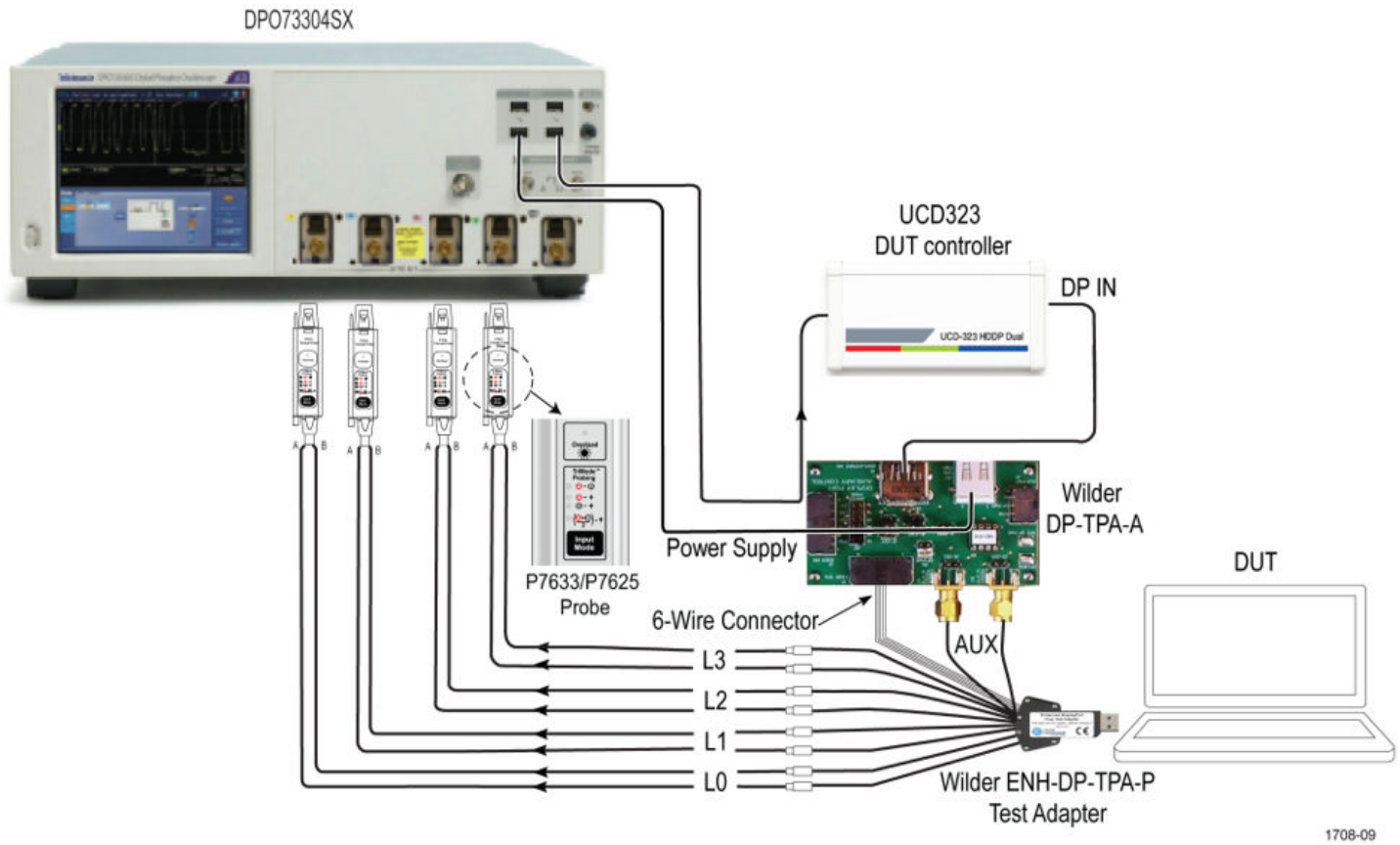
About running tests (on page 20)

Equipment connection setup

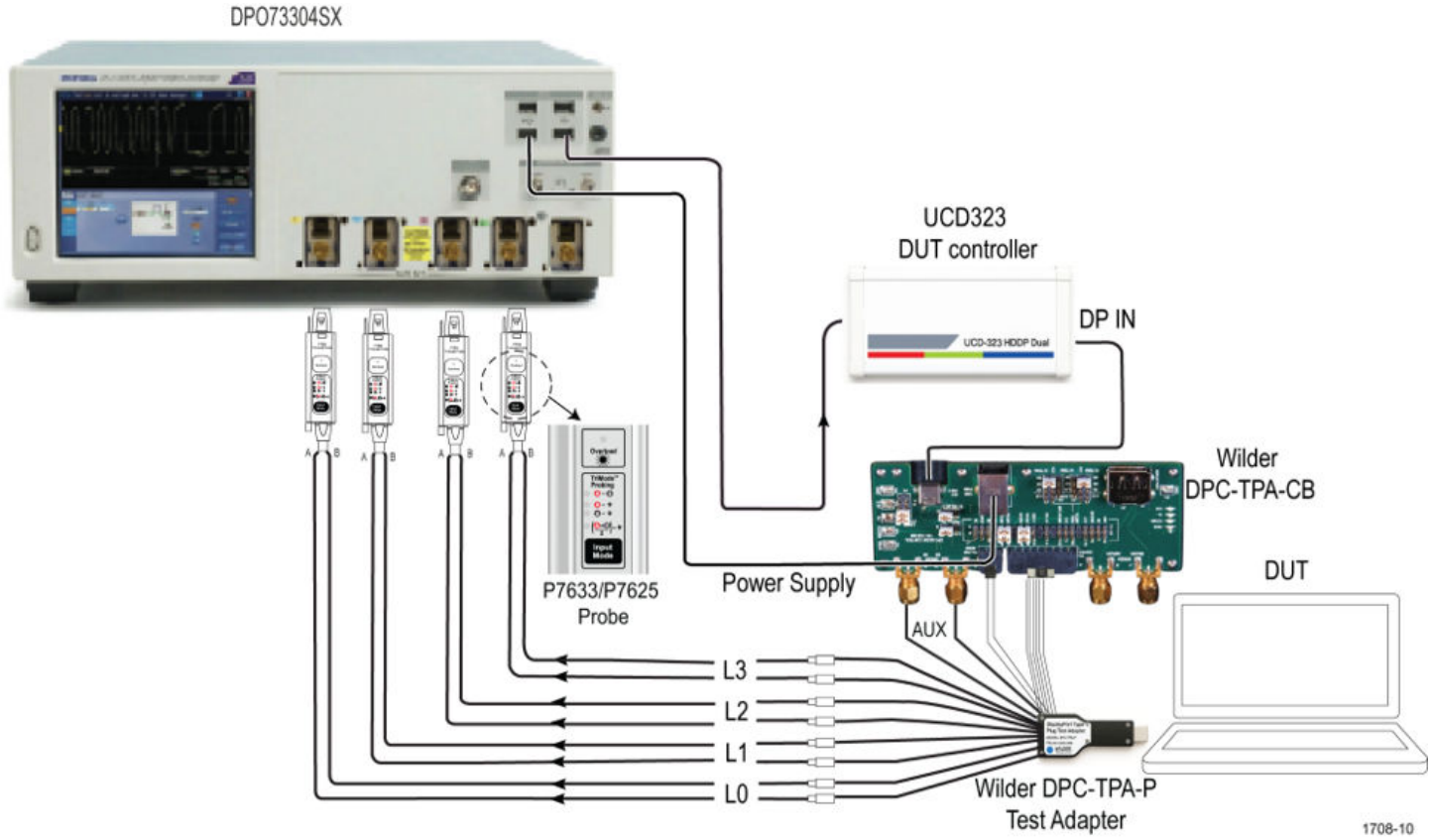
To run tests, you need the following equipment (for details, see Minimum System Requirements (on page 11)):

- A supported Tektronix oscilloscope (on page 11)
- TCA-SMA or Differential Probes (for example, P7625)
- The device under test
- Test fixtures

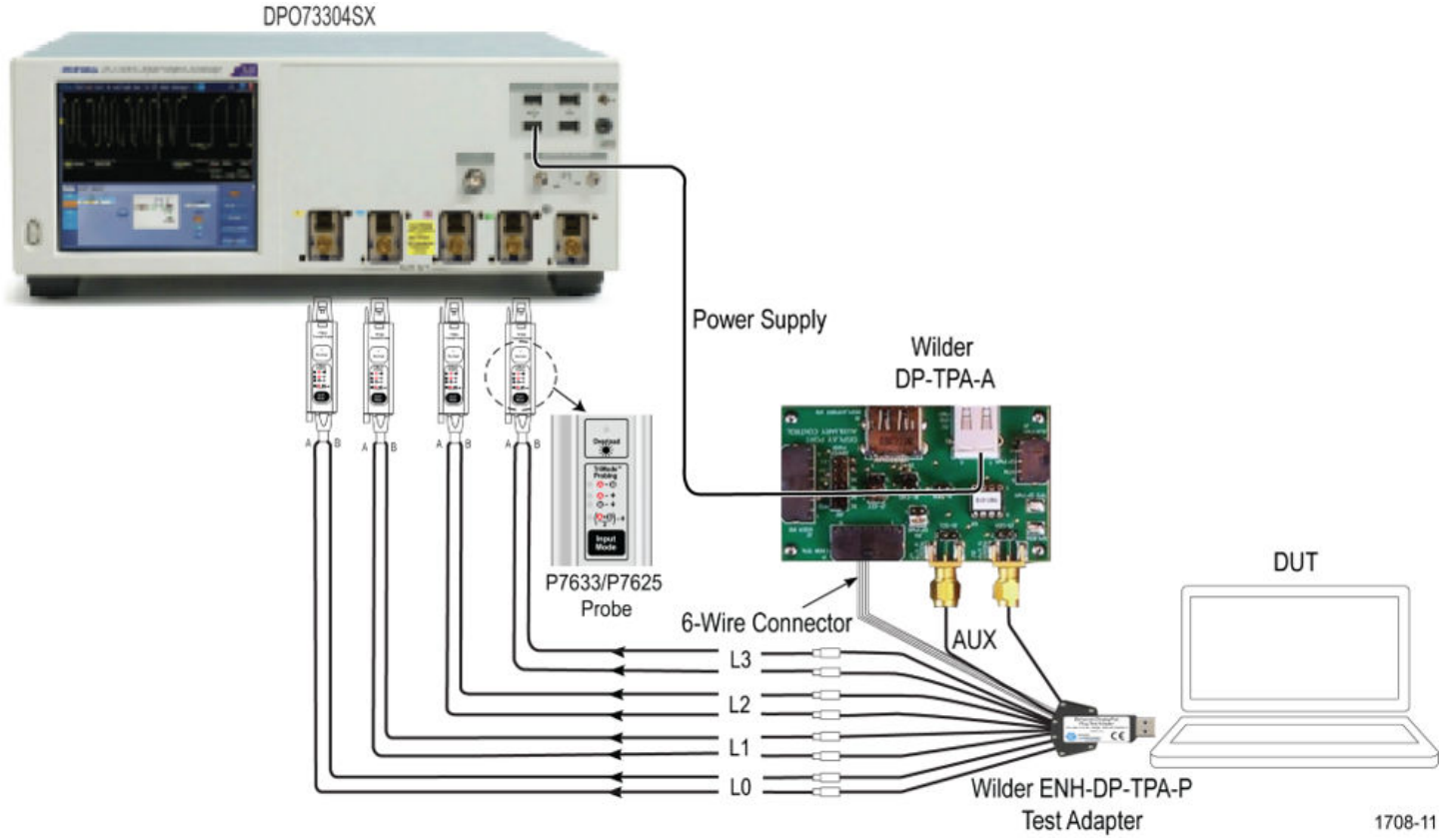
The following diagrams show different setups.



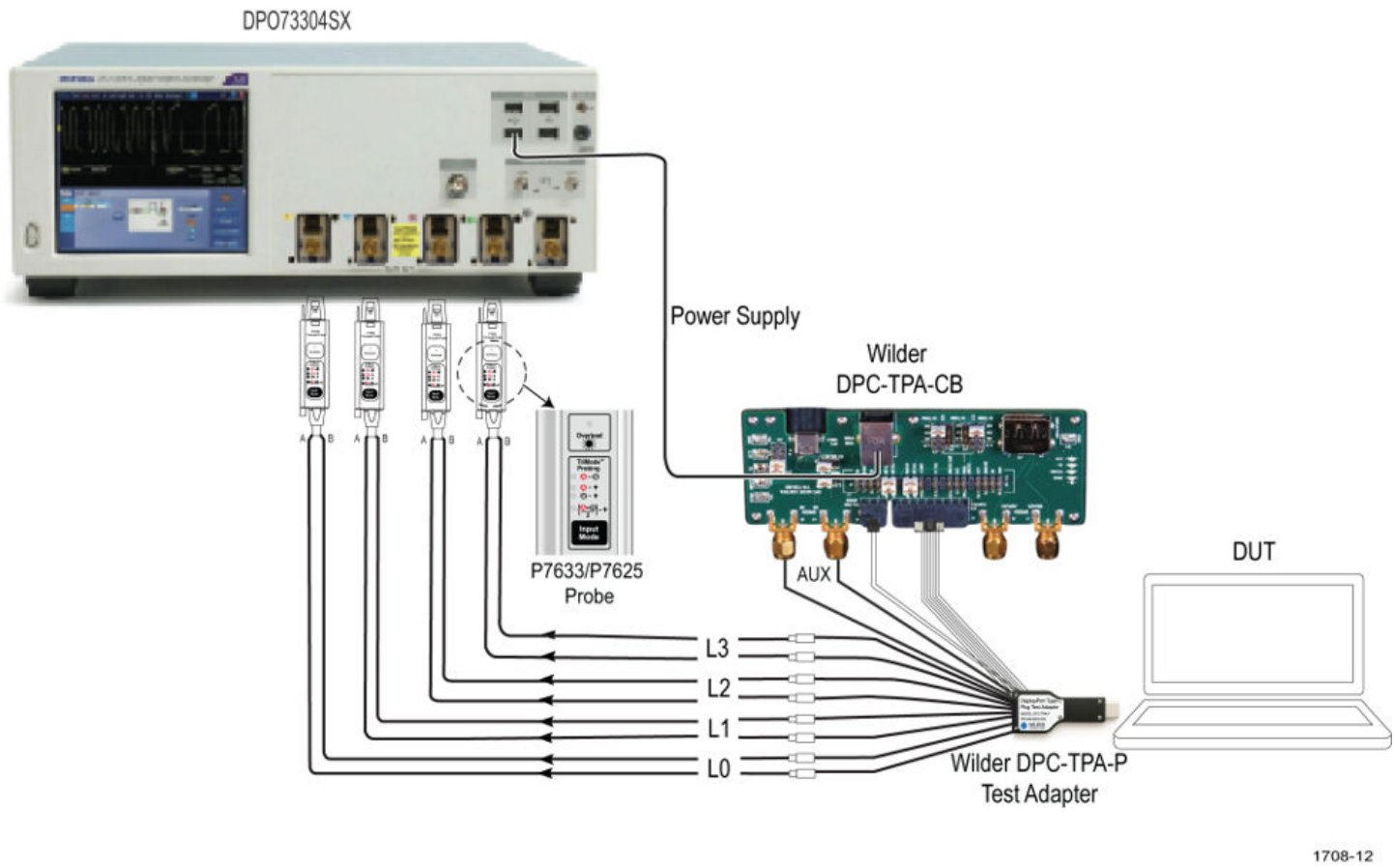
DisplayPort2.1 Standard Type – UCD323 DUT Control



DisplayPort2.1 C-Type – UCD323 DUT Control



DisplayPort2.1 Standard Type – Manual DUT Control



DisplayPort2.1 C-Type – Manual DUT Control

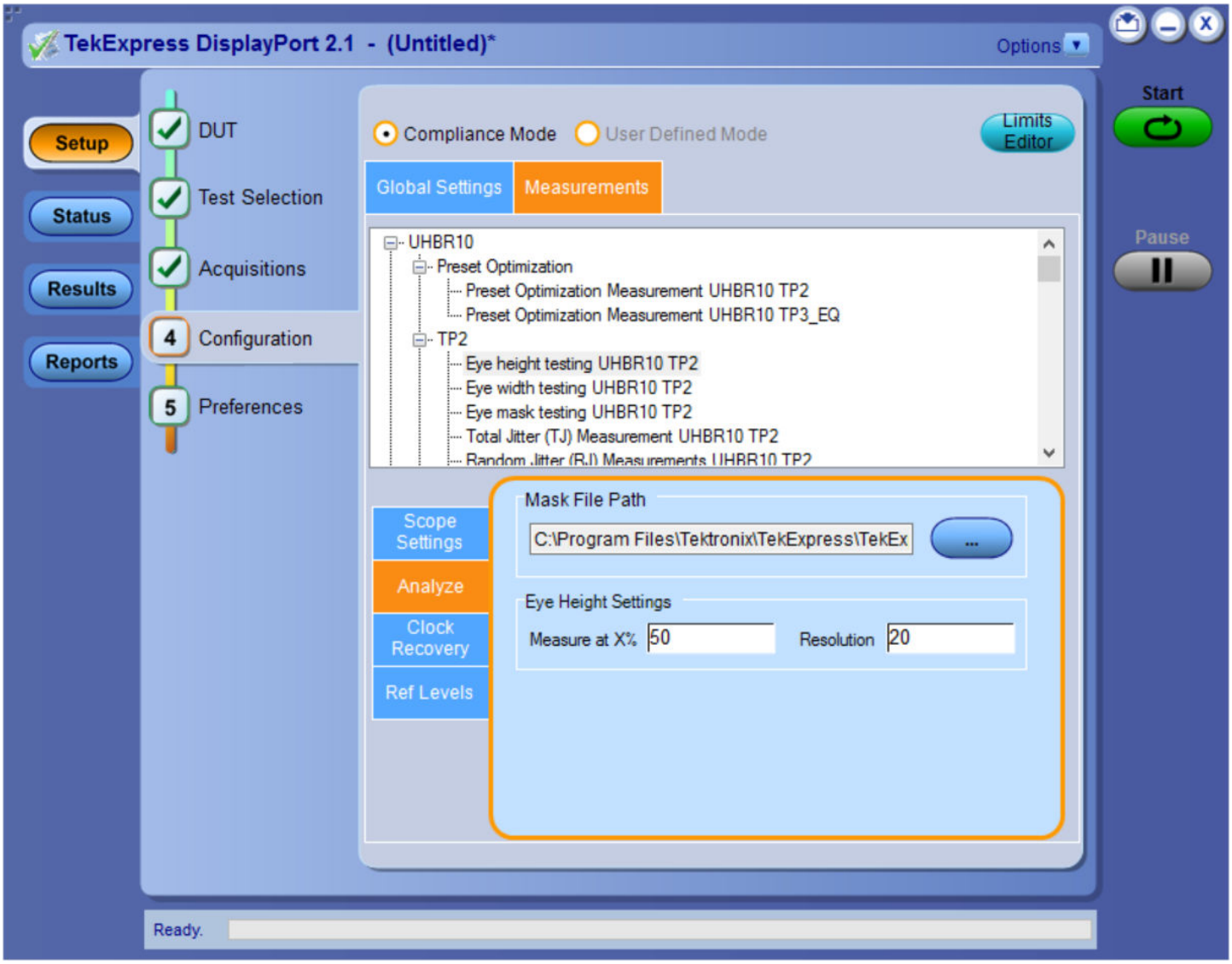
See Also

About setting up tests (on page 14)

Pre-Run checklist (on page 22)

Deskew channels (on page 139)

Individual test configuration



In the Compliance mode the you can change a couple of test specific configurations.

- Preset selection
- Cable filters for Eye Diagram Measurement

About running tests

After selecting and configuring tests, review the pre-run checklist (on page 22) and then click **Start** to perform the tests. The application acquires and analyzes the data, then displays a report when the tests are complete.

While the tests are running, other applications may display windows in the background. The TekScope application takes precedence over other applications, but you can switch to other applications using the Alt+Tab key combination. To keep the TekExpress DisplayPort 2.1 application on top, select **Keep On Top** from the DisplayPort 2.1 application Options menu (on page 26).

Waveforms generated during the test are automatically saved when you save the related test setup, so you can run tests in pre-recorded mode (on page 23).

See Also

Before you click start (on page 21)

About configuring tests (on page 45)

About setting up tests (on page 14)

Before you click start

Before you run tests for the first time, do the following:

1. Understand where your test files are stored on the instrument.

   After you install and launch TekExpress DisplayPort 2.1, it creates the following folders on the oscilloscope:

   - Windows 10: `C:\Program Files\Tektronix\TekExpress\TekExpress DisplayPortTx 2.1`
   - `\My Documents\My TekExpress\DisplayPort 2.1`
   - `\My Documents\My TekExpress\DisplayPort 2.1\Untitled Session`

   Every time you launch TekExpress DisplayPort 2.1, an `Untitled Session` folder is created in the `DisplayPort 2.1` folder. The `Untitled Session` folder is automatically deleted when you exit the `DisplayPort 2.1` application.

   CAUTION: Do not modify any of the session files or folders because this may result in lost data or corrupted session files. Each session has multiple files associated with it. When you save a session, a .TekX file, and a folder named for the session and containing the associated files, is created on the oscilloscope X: drive.

2. Map the shared My TekExpress folder as X: (X drive) on all the instruments used in test setups running Microsoft Windows Operating System.

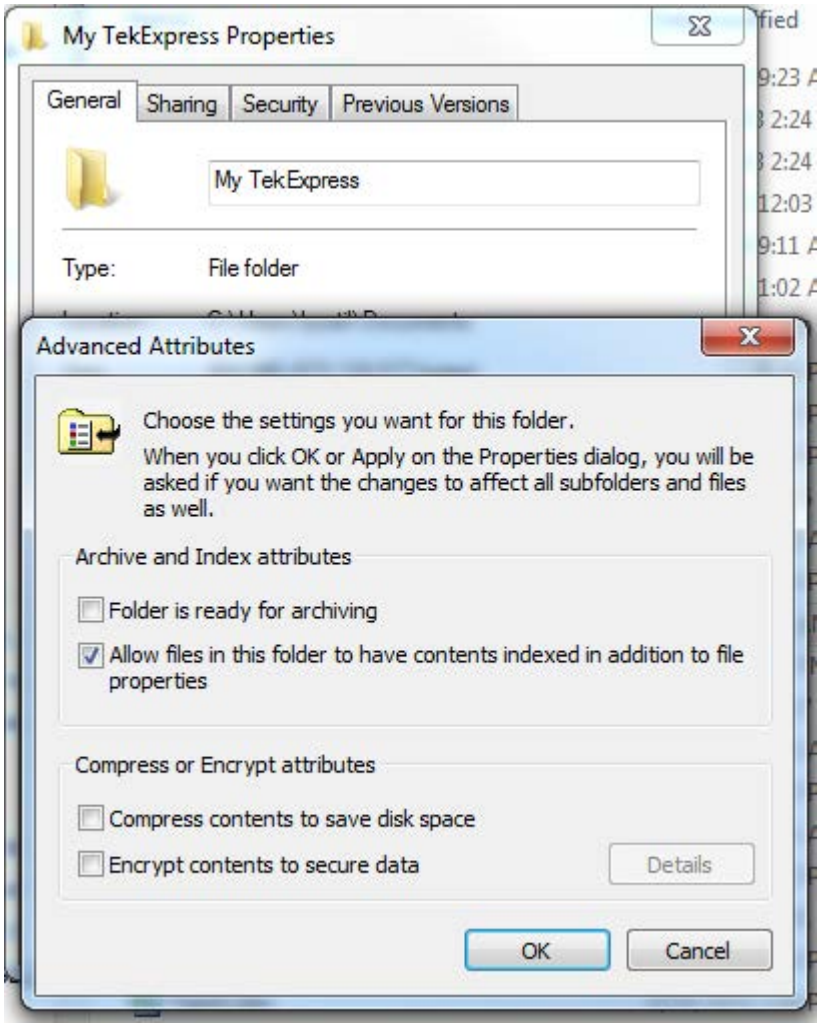
   The `My TekExpress` folder has the share name format <domain><user ID>My TekExpress. Or, if the instrument is not connected to a domain, then the share name format is `<instrument name><user ID> My TekExpress`. This shared folder is used to save the waveform files and is used during other file transfer operations.

   NOTE: If the X: drive is mapped to any other shared folder, the application will display a warning message asking you to disconnect the X: drive manually.

3. Make sure that the `My TekExpress` folder has read and write access, and that the contents are not set to be encrypted:

   1. Right-click the folder and select **Properties**.
   2. Select the **General** tab and then click **Advanced**.
   3. In the Advanced Attributes dialog box, make sure that the option **Encrypt contents to secure data** is NOT selected.

      Example.



4. Refer the pre-run checklist (on page 22) before you run a test.

See Also

View test-related files (on page 138)

Application directories (on page 137)

File name extensions (on page 138)

Pre-Run checklist

Do the following before you click Start to run a test. If this is the first time you are running a test on a setup, refer to the information in Before you click start (on page 21).

1. Make sure that all the required instruments are properly warmed up (approximately 20 minutes).
2. Perform the Signal Path Compensation (SPC).
   a. On the oscilloscope main menu, select the **Utilities** menu.
   b. Select **Instrument Calibration**.
3. Deskew channels (on page 139).
4. Make sure that the application is able to find the oscilloscope. If it cannot, Refer TekExpress instrument control settings (on page 29) to search for connected instruments.

a. Launch the DisplayPort 2.1 application.
b. Select the **Setup** panel and then click the **Test Selection** tab.
c. Select any test and then click **Configure**.
d. In the Configuration section, click **Global Settings**.
e. In the Instruments Detected section, click the drop-down arrow to the right of Real Time Scope and make sure that the correct oscilloscope is listed.

See Also

Equipment connection setup (on page 16)

Run a test in pre-recorded mode

This option allows you to re-run a complete test using just the oscilloscope and the saved test setup files.

NOTE: Running the test in pre-recorded mode does not replace the existing saved test results. Instead, if you save the test under the same name, the results are saved in a session folder named for the date and time of the session.

1. In the Setup panel, select the **DUT** tab and then select **Use pre-recorded waveform files**.

   A Run session field displays, showing the session that ran for this test. If there is more than one session that contains test data (not an empty session folder) these are available in the Run session drop-down list. Select the desired session from the drop-down list.
2. Select the **Acquisitions** tab.
3. In the Set acquisition tab parameters (on page 41), look in the Waveform FileName column.
4. If no waveform files are listed, click the ellipsis button ( ) and then locate and select the desired waveform files. Skip to step 7.
5. If waveform files are listed, verify that the listed files are the ones you want to use. If they are not, or if you want to add a file, do any of the following as needed:
   - To remove a waveform file from the list, click the ellipsis button and select **Remove Waveform File**.
   - To replace a waveform file, click the ellipsis button, select **Replace Waveform File**, then locate and select the desired file.
   - To add a waveform file, click the ellipses button, select **Select Waveform Files**, then locate and select the waveform files.
6. Click **Start** to run the test.

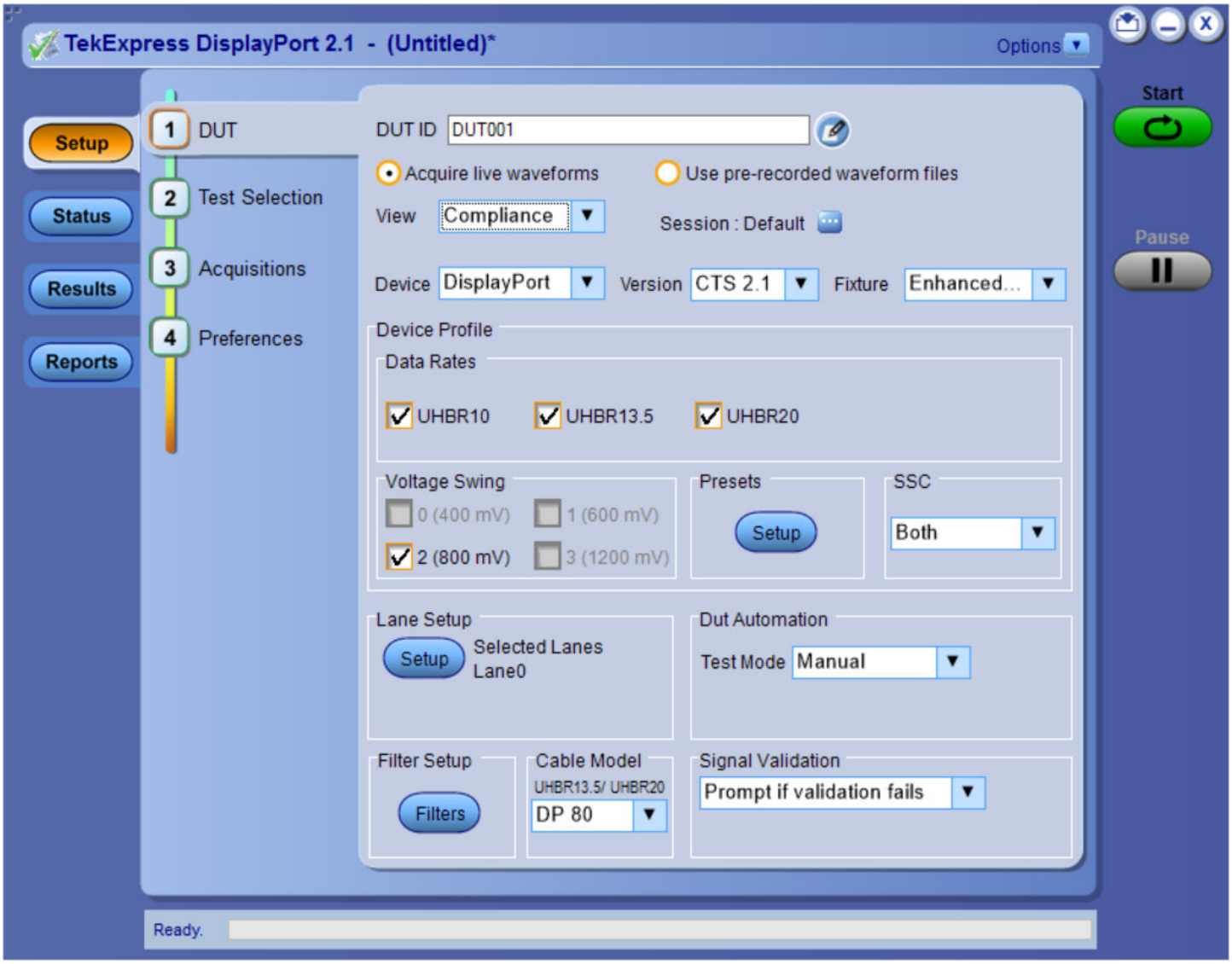
See Also

Before you click start (on page 21)

Set acquisition tab parameters (on page 41)

Starting the application

To start the TekExpress DisplayPort 2.1, select **Applications > TekExpress DisplayPort 2.1** from the oscilloscope menu bar.

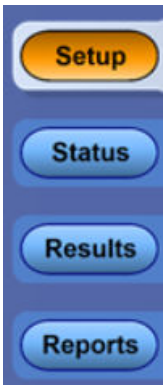


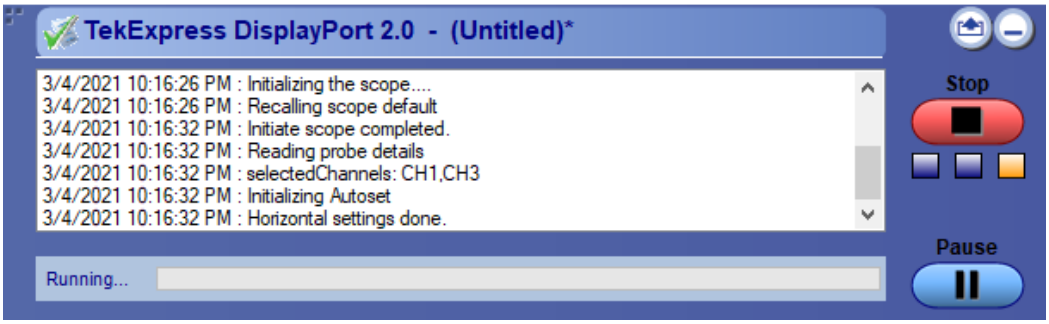
Application launch screen

To keep the TekExpress DisplayPort 2.1 application on top of any application, select **Keep On Top** from the options menu (on page 26). If the application goes behind the oscilloscope application, select **Applications > TekExpress DisplayPort 2.1** to bring the application to the front.

This section describes the application controls.

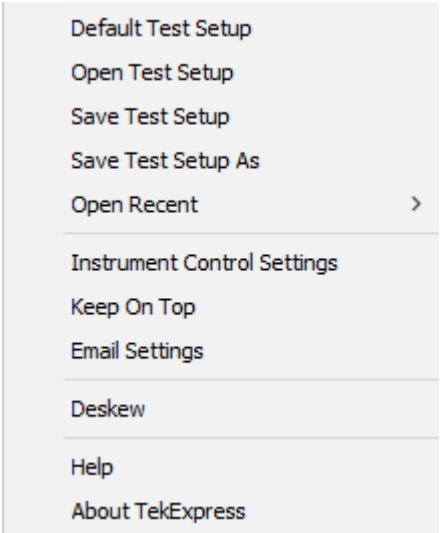
Application control description

Item	Description
Options menu (on page 26)	Menu to display global application controls.
Test panel 	Controls that open tabs for configuring test settings and options.
Start / Stop button	Use the **Start** button to start the test run of the measurements in the selected order. If prior acquired measurements are not cleared, then new measurements are added to the existing set. The button toggles to the Stop mode while tests are running. Use the **Stop** button to abort the test.
Pause / Continue button	Use the **Pause** button to pause the acquisition. When a test is paused, this button changes as **Continue**.
Clear button	Use the **Clear** button to clear all existing measurement results. Adding or deleting a measurement, or changing a configuration parameter of an existing measurement, also clears measurements. This is to prevent the accumulation of measurement statistics or sets of statistics that are not coherent. This button is available only on Results panel: View summary of test results (on page 54). **NOTE:** This button is visible only when there are results data on the panel.
Application window move icon	Place the cursor over the top of the application window to move the application window to the desired location

Item	Description
Minimize icon	Minimizes the application.
Close icon	Close the application.
Mini view / Normal view	Toggles the application between mini view and normal view. Mini view displays the run messages with the time stamp, progress bar, Start / Stop button, and Pause / Continue button. The application moves to mini view when you click the **Start** button. 

Options menu functions

To access the **Options** menu, click in the upper-right corner of the application. It has the following selections:

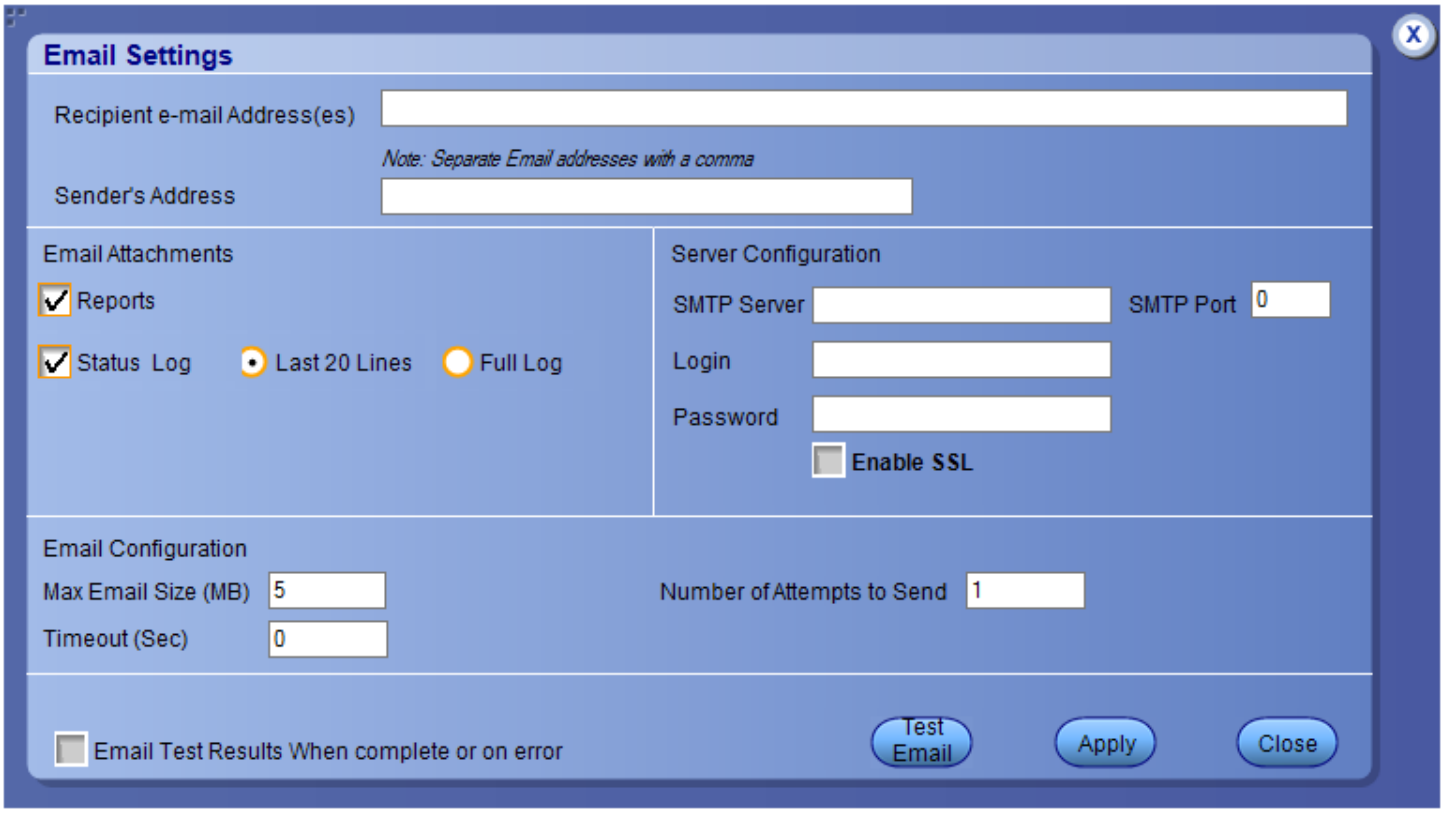


Options menu settings

Menu	Function
Default Test Setup	Opens a new test setup with default configurations.
Open Test Setup	Opens a previously saved test setup. Displays the list of previously saved test setup file names. Make the selection and click **OK** to open the test setup.
Save Test Setup	Saves the current test configurations with the specified file name.
Save Test Setup As	Saves the current test setup with a different file name or file type.
Open Recent	Displays the recently opened test setup file names. Make the selection and click **OK** to open the test setup.
Instrument control settings (on page 29)	Detects, lists, and refreshes the connected instruments found on the specified connections (LAN, GPIB, USB, Serial, Non-VISA Resources, TekLink, and VXI).
Keep On Top	Always keeps the TekExpressDisplayPort 2.1 application on top of all the applications.
Email settings (on page 27)	Configures email options for test run and result notifications.
Deskew	Loads oscilloscope channel deskew settings into the application.
Help	Displays the TekExpress DisplayPort 2.1 help.
About TekExpress	Displays the application name, version, and hyperlink to end the user license agreement.

Configure email settings

Use the **Email Settings** utility to get notified by email when a measurement completes or produces any error condition. Follow the steps to configure email settings:



Email settings window

1. Select **Options > Email Settings** to open the Email Settings dialog box.
2. (Required) For **Recipient email Address(es)**, enter one or more recipient email addresses. To include multiple addresses, separate the addresses with commas.
3. (Required) For **Sender's Address**, enter the email address used by the instrument. This address consists of the instrument name, followed by an underscore, followed by the instrument serial number, then the @ symbol, and the email server ID. For example: user@yourcompany.com.
4. (Required) In the **Server Configuration** section, type the SMTP Server address of the Mail server configured at the client location, and the SMTP Port number, in the corresponding fields.

   If this server requires password authentication, enter a valid login name, password, and host name in the corresponding fields.

   NOTE: If any of the above required fields are left blank, the settings will not be saved, and email notifications will not be sent.

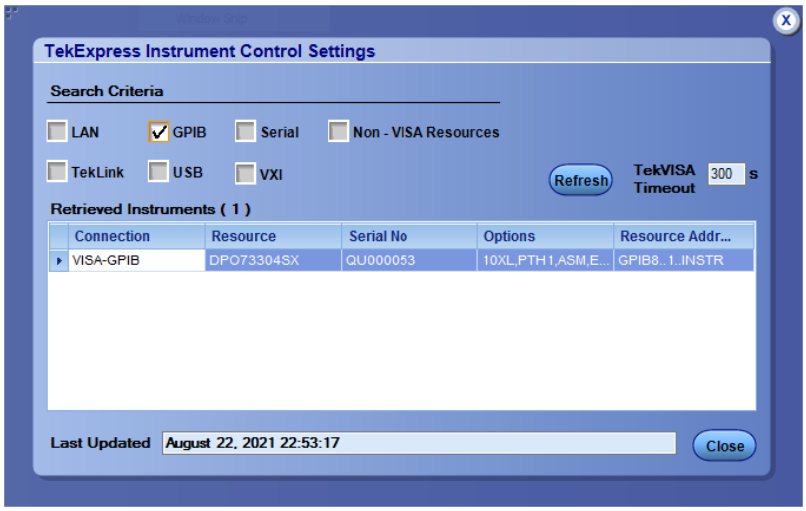
5. In the **Email Attachments** section, select from the following options:
   - **Reports**: Select to receive the test report with the notification email.
   - **Status Log**: Select to receive the test status log with the notification email. If you select this option, then also select whether you want to receive the full log or just the last 20 lines.
6. In the **Email Configuration** section:
   - Enter a maximum file size for the email message. Messages with attachments larger than this limit will not be sent. The default is 5 MB.
   - Enter the number in the Number of Attempts to Send field, to limit the number of attempts that the system makes to send a notification. The default is 1. You can also specify a timeout period.
7. Select the **Email Test Results When complete or on error** check box. Use this check box to quickly enable or disable email notifications.

8. To test your email settings, click **Test Email**.
9. To apply your settings, click **Apply**.
10. Click **Close** when finished.

TekExpress instrument control settings

Use the **TekExpress Instrument Control Settings** dialog box to search the instruments (resources) connected to the application. You can use the **Search Criteria** options to search the connected instruments depending on the connection type. The details of the connected instrument is displayed in the Retrieved Instruments window.

To access, click **Options** > **Instrument Control Settings**. Select **GPIB** as search criteria for TekExpress application and click **Refresh**. The connected instruments displayed in the Retrieved Instruments window and can be selected for use under Global Settings in the test configuration section.



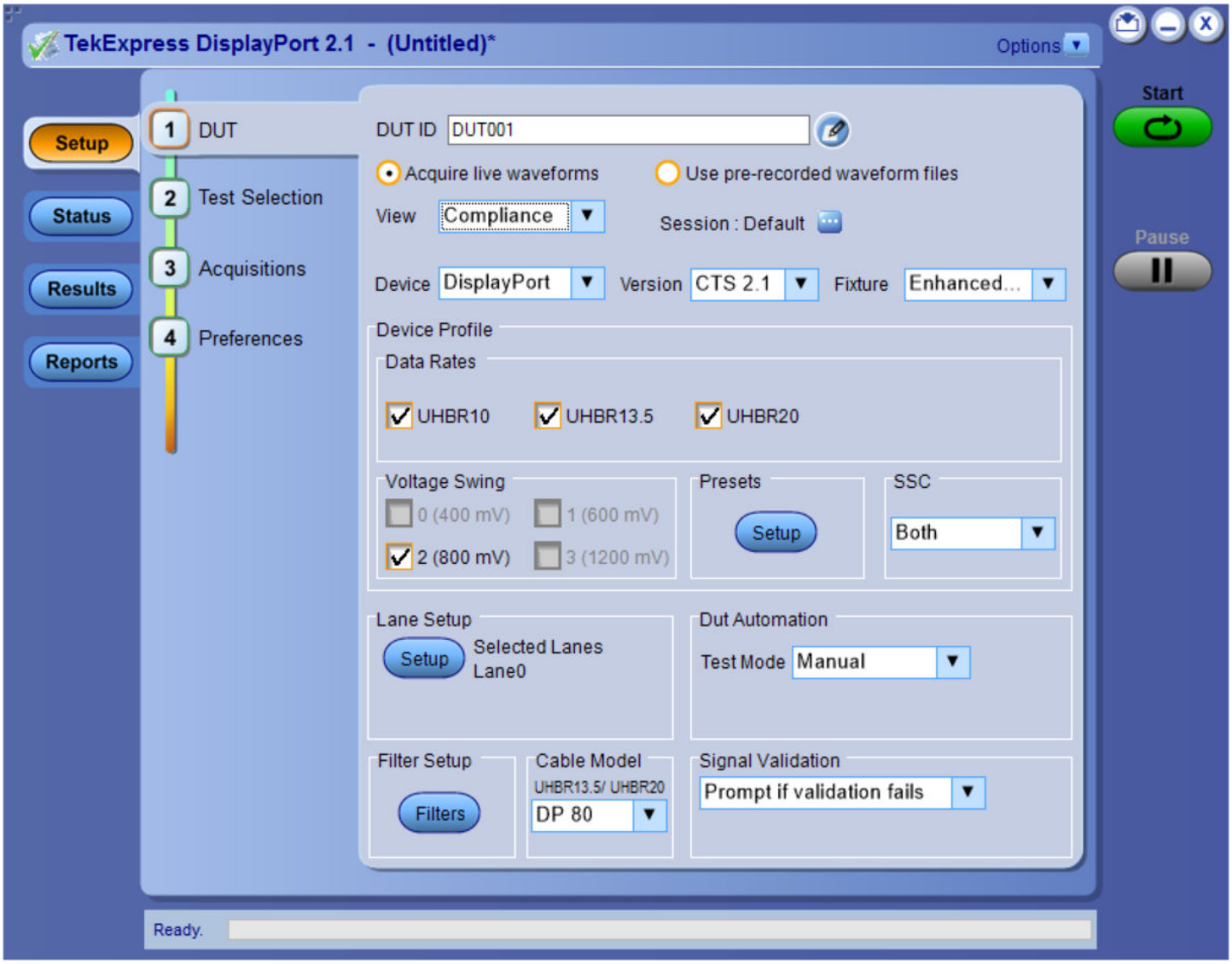
TekExpress Instrument Control Settings window

See also

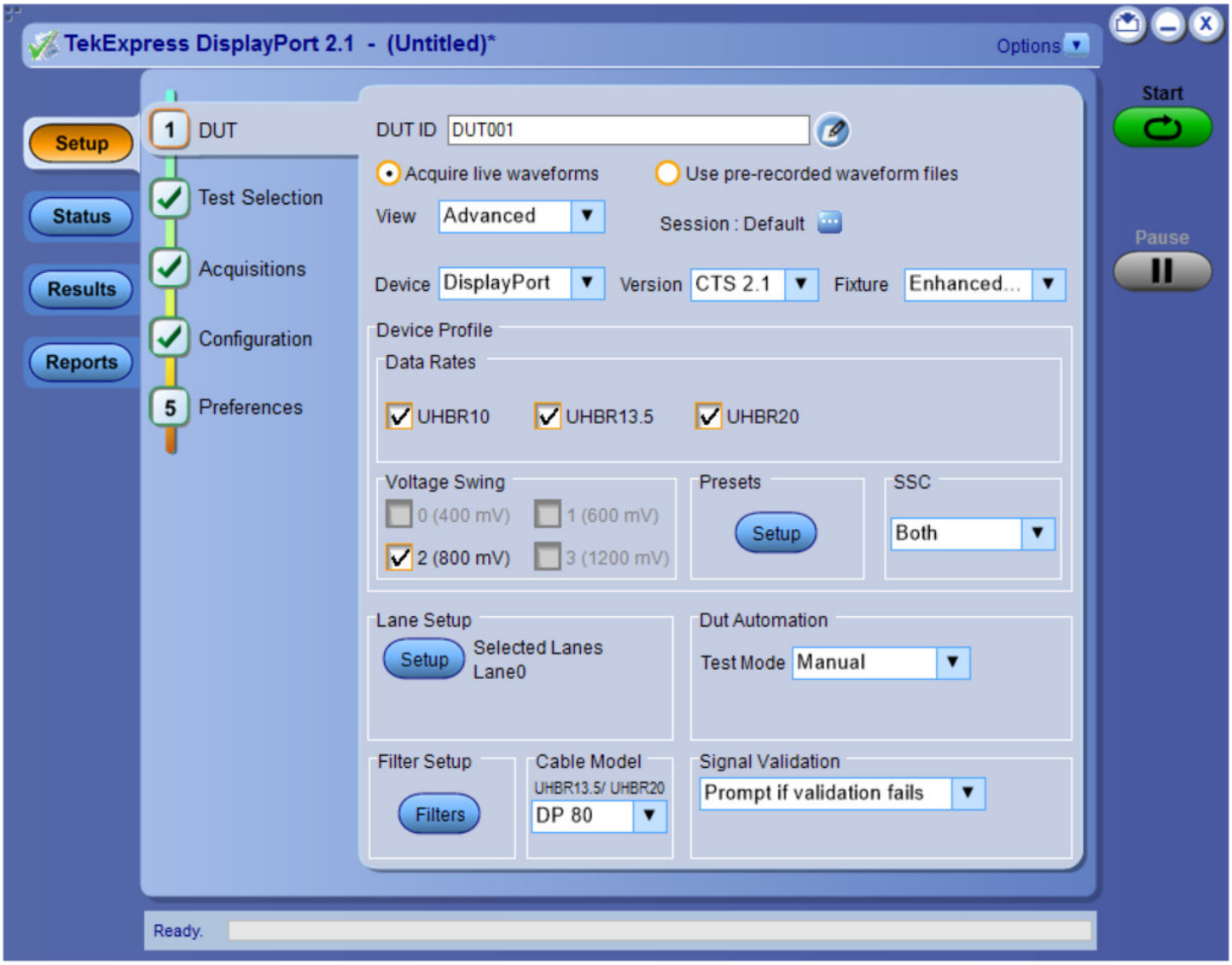
Options menu functions (on page 26)

Setup panel: Configure the test setup

The Setup panel contains sequentially ordered tabs that help guide you through a typical test setup and execution process.



Setup panel with compliance view



Setup panel with advanced view

By default the DUT, Test Selection, Acquisitions, and Preferences tabs are displayed. The Configuration tab is available only when you set the **View** option as **Advance** in the DUT tab. Otherwise, configuration settings for tests selected in the Test Selection tab are available from the **Configure** button on the Test Selection tab.

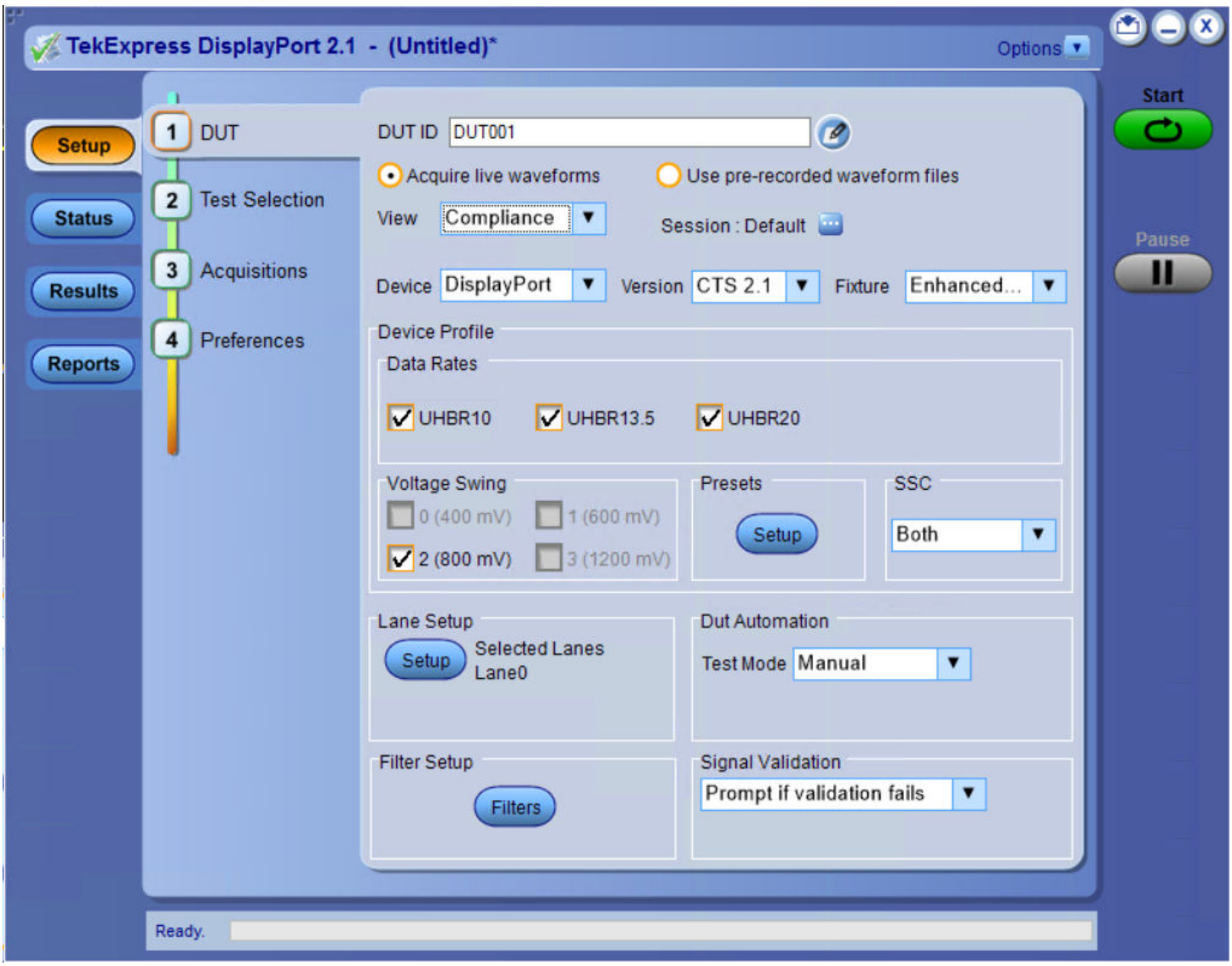
Options selected in a preceding tab affect options available in the next tab down. For example, Device Profile settings affect the list of tests available for selection in the Test Selection tab. However, you can switch between the tabs in any order if you need to modify your test parameters.

Refer also

About setting up Tests (on page 14)

DUT: Set DUT settings

Use the DUT tab to select parameters for the device under test. The settings are global and apply to all tests for the current session. The DUT settings available and the options in the drop-down list depends on the selections made in the settings. DUT settings also affect the list of available tests in the Test Selection tab.



DUT panel

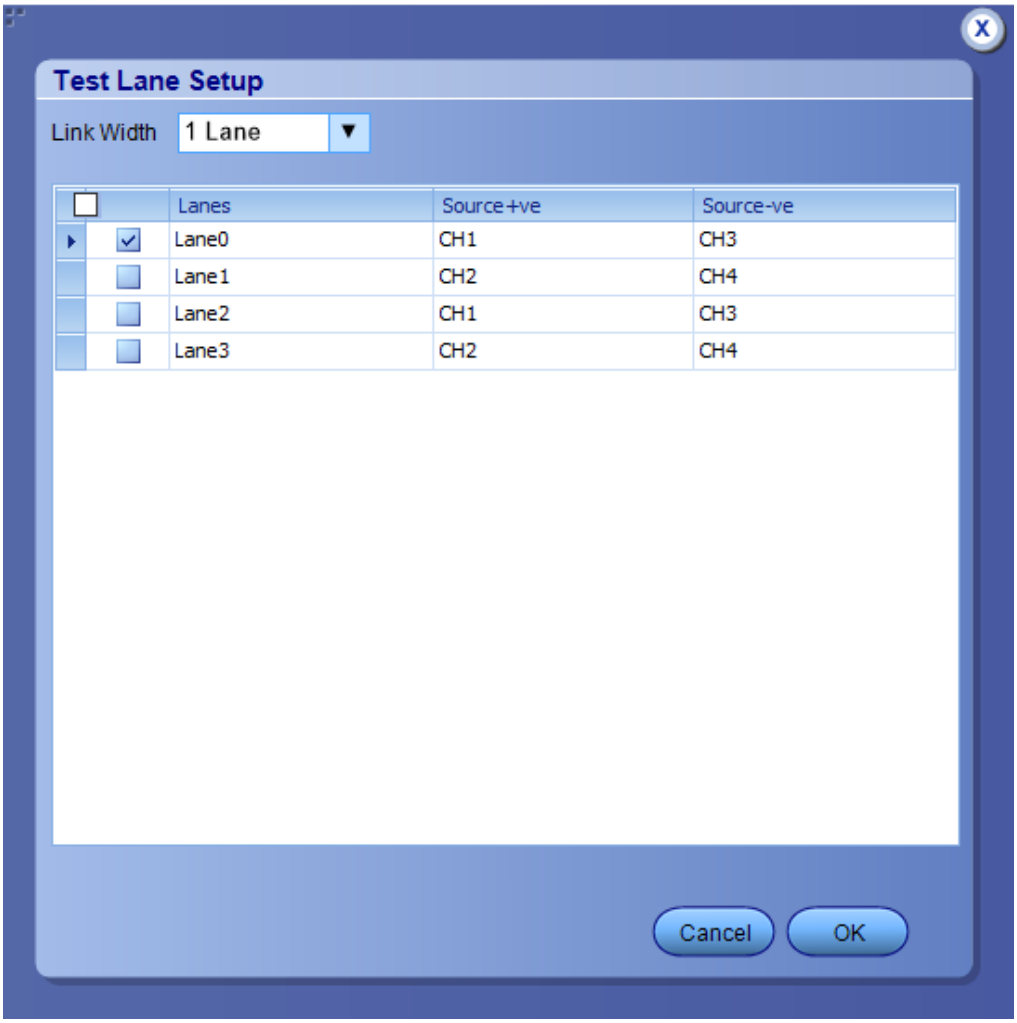
Click **Setup > DUT** to access the DUT parameters:

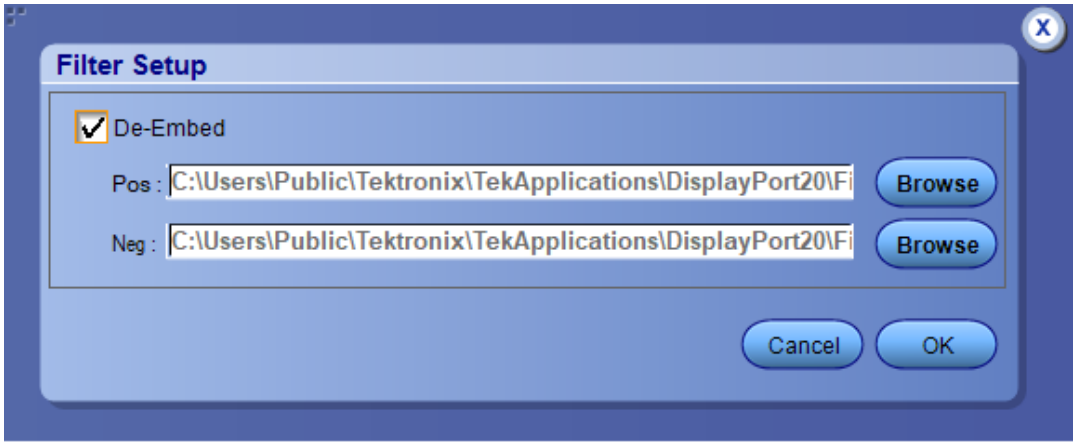
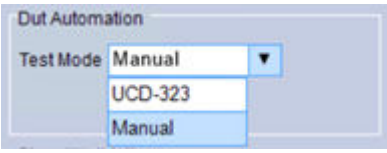
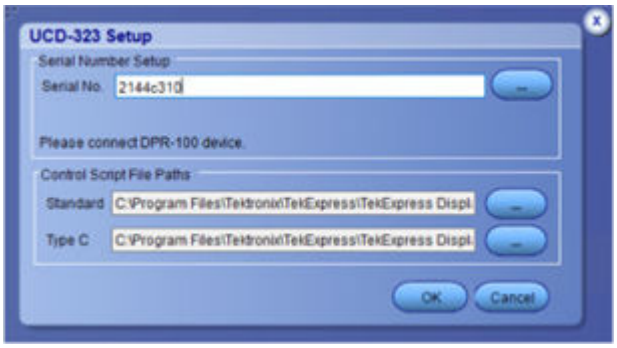
DUT tab settings

Setting	Description
DUT ID	Adds an optional text label for the DUT to reports. The default value is DUT001. The maximum number of characters is 32. You cannot use the following characters in an ID name: (.,..,...,\,/:?”<>|*).
Comments icon (to the right of the DUT ID field)	Open a Comments dialog box which allows you to enter optional text to add to a report. You can enter a maximum number of 256 characters. Refer Select report options to enable or disable comments which appear on the test report.
Help	Open the help document with DUT page selected.

Setting	Description
Acquire live waveforms	Acquire active signals from the DUT for measurement and analysis.
Use prerecorded waveform files	Run tests on a saved waveform. Refer Open (load) a saved test setup to save the test setup.
View	Set the view mode of the user interface for the test session. Select the mode of view from the drop-down: ▪ Compliance ▪ Advanced The **Configuration** tab is hidden in the **Compliance** mode and is only available when the **View** mode is set to **Advanced**.
Version	Displays the CTS version. DisplayPort 2.1 application supports only CTS 2.1b version.
Fixture	Set the type of fixture used for the test from the drop-down: ▪ Enhanced DP ▪ Type C ▪ mDP
Data Rates	Select one or multiple data rates for waveform acquisition from the drop-down: ▪ UHBR10: Ultra High Bit Rate 10 (10 Gb/S) ▪ UHBR13.5: Ultra High Bit Rate 13.5 (13.5 Gb/S) ▪ UHBR20: Ultra High Bit Rate 20 (20 Gb/S)
Voltage Swing	Set the voltage swing for the signal quality test. Only 800 mV is supported for DisplayPort 2.1. **NOTE:** 400 mV, 600 mV, and 1200 mV settings are not available.

Setting	Description
Presets	Sixteen presets (P0 to P15) are supported for signal quality testing for each data rate. Click **Setup** to view the set of presets. For each lane, individual tabs are available for each data rate to select the required presets. **Lane Selection**: Select a lane from the left panel to view or modify its preset selection. **Select All**: Select all presets in the current data rate tab for the selected lane. **Deselect All**: Deselect all presets in the current data rate tab for the selected lane. **Apply All**: Copy the preset selections for all data rates and test points from the selected lane to all other lanes. **Cancel**: Discard the changes and close the dialog box. **OK**: Save changes and close the dialog box.
SSC	Select the option for Spread Spectrum Clocking from the drop-down: ▪ SSC Enable: When selected, waveforms will be acquired with SSC. ▪ SSC Disable: When selected, waveforms will be acquired without SSC. ▪ Both: When selected, 2 sets of waveforms will be acquired for each acquire type. One with and one without SSC.

Setting	Description
Lane Setup	Set the lanes to be used for the acquisition of the signal. Click **Setup** button and select the desired number of test lanes for the test session. The **Link Width** determines the number of test lanes. ▪ 1 Lane: When selected, only one lane can be used. ▪ 2 Lanes: When selected, any one lane or two lanes can be used. ▪ 4 Lanes: When selected, only a lane or two lanes or four lanes can be used. 

Setting	Description
Filter Setup	Set the filter files for de-embedding the signal during acquisition. Click **Filters** to browse and select the De-embed filters for acquisition on positive and negative channels. The **De-embed** option is unchecked by default. 
DUT Automation	Control to pick the DUT Control Type.  **Manual (default)**: You will be prompted to configure the DUT manually during the test. **UCD-323**: Select this option to configure the DUT using Unigraf UCD-323. The UCD-323 Setup window is launched when UCD-323 is selected in the **Test Mode** dropdown or the setup button is clicked.  **Serial No.**: Enter the valid serial number to use UCD-323. **Control Script File Paths**: Browse and select the Standard and Type C script files to control the DUT using UCD-323.

Setting	Description
Signal Validation	▪ **Prompt if validation fails**: When selected, user is prompted if pattern validation fails. The user will be given the option to Reacquire, Use Anyway, Skip and Abort the execution. ▪ **Skip test if validation fails**: When selected, it will skip the corresponding test(s) if pattern validation fails. ▪ **Skip validation**: When selected, skips the validation for all the patterns. ▪ **Validate pattern but use pattern as is**: Select to validate the pattern. If the validation fails, the application retries the link training for 3 times. If the validation fails even after 3 times, then it will use the pattern as is.

See Also

Test Selection: Select the tests (on page 38)

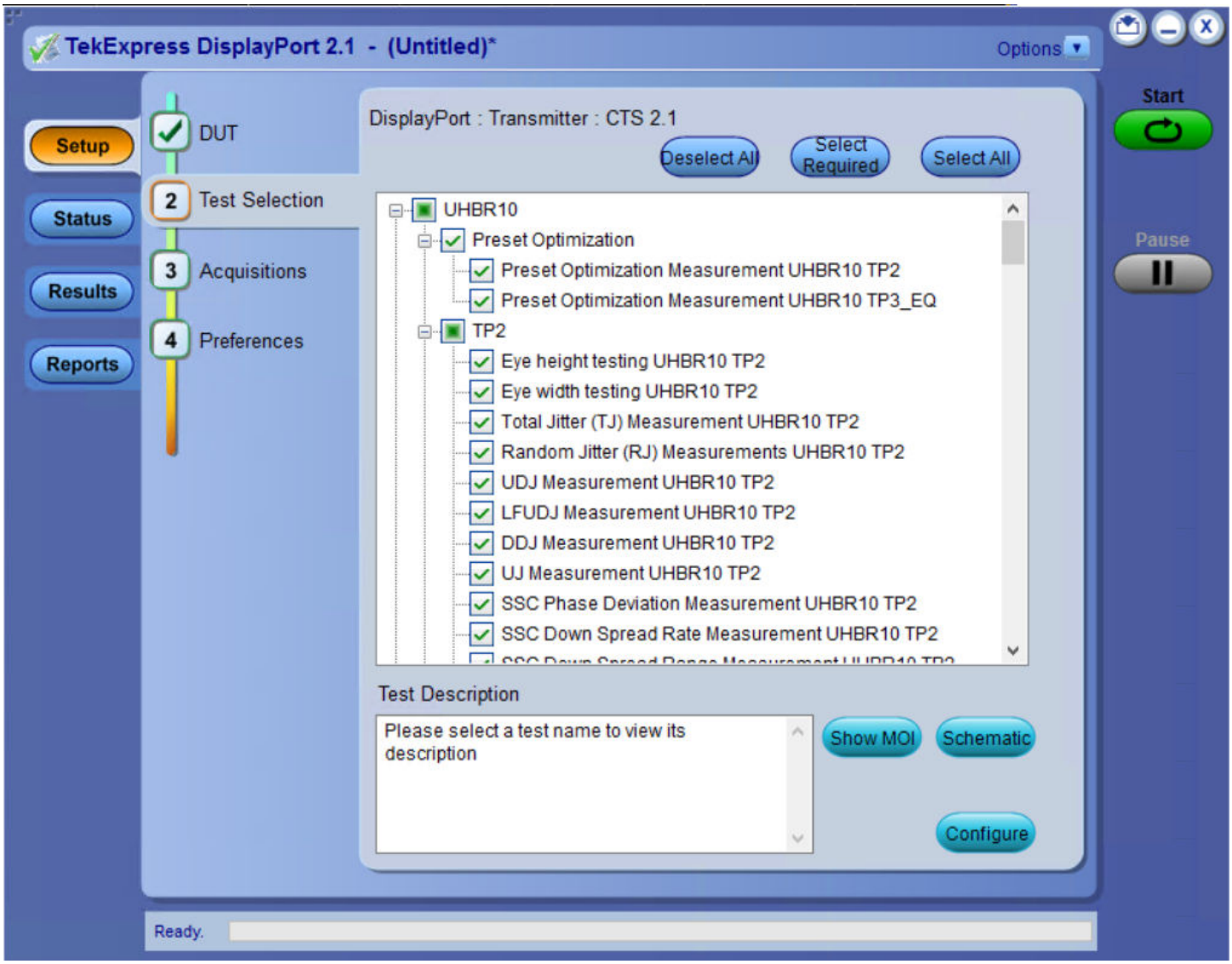
About setting up tests (on page 14)

Use pre-recorded waveforms for analysis (on page 41)

Acquire live waveforms for analysis (on page 44)

Test Selection: Select the tests

Use the **Test Selection** tab to select **DisplayPort 2.1** tests. Listed tests depend on settings in the DUT tab.



Test selection tab

Test Selection Types

Test Type	Description
Preset Optimization	Tests to find out the optimal preset amongst all selected presets for signal tests.
TP2	Signal tests that are performed at TP2 test point.
TP3_EQ	Signal tests that are performed at TP3_EQ test point.
Transmitter Equalization	Transmitter Equalization tests to calculate Preshoot, Deemphasis and Swing on SQ128 pattern, where preshoot, deemphasis and swing are the ratio of voltages for different DUT configuration

Test Selection tab settings

Setting	Description
Deselect All, Select All	Deselect or select all tests in the list.
Tests	Click a test to select or deselect. Selecting a test also show details about the selected test in the Test Description pane. All required tests are selected in the Compliance test mode.
Schematic	Displays equipment connection setup for the selected measurements. You need to select at least a measurement before you click the **Schematic** button.
Show MOI	Displays the MOI

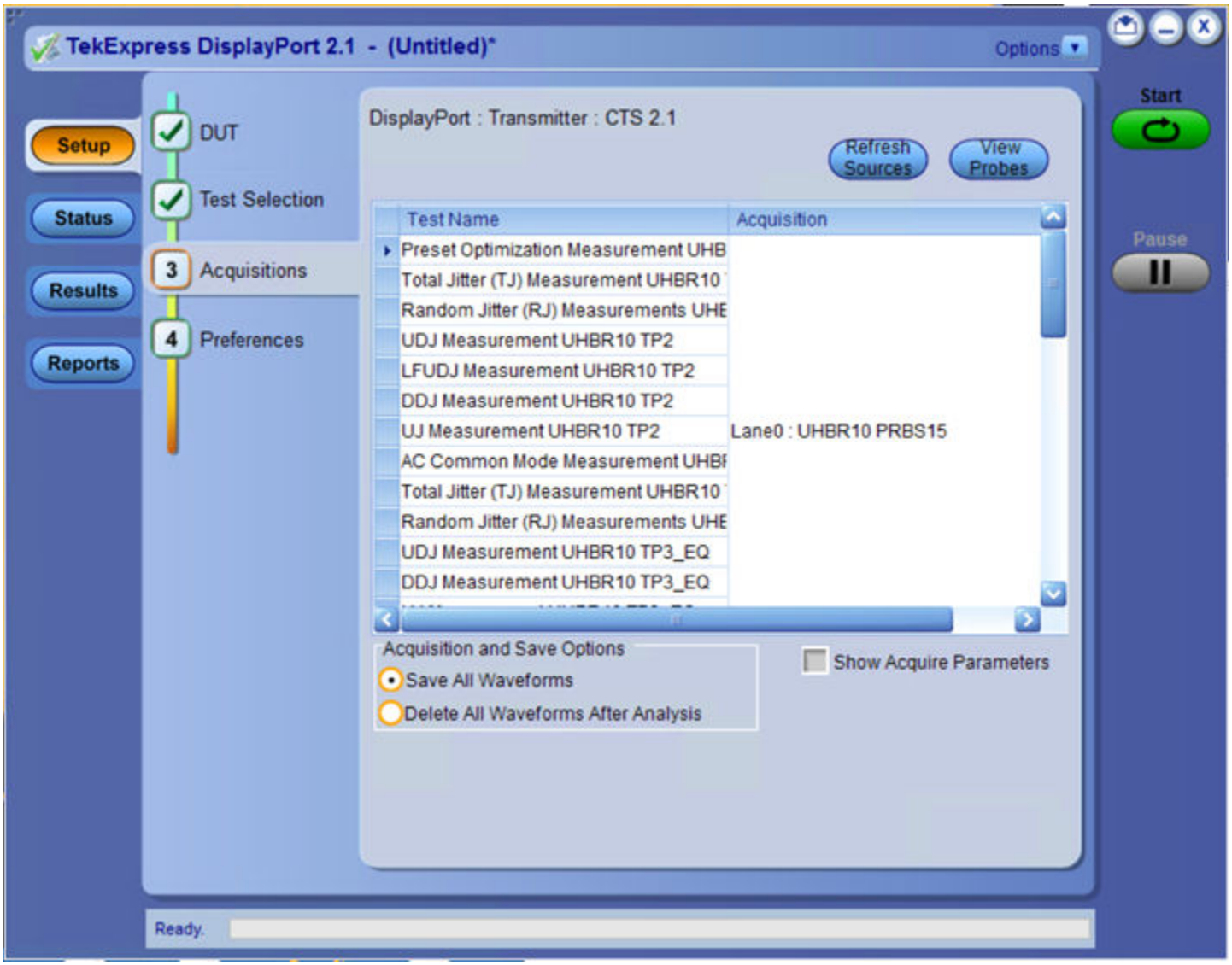
See Also

Set acquisition tab parameters (on page 41)

About setting up tests (on page 14)

Acquisitions: Set waveform acquisition settings

Use Acquisitions tab to view the test acquisition parameters. The contents displayed on this tab depends on the DUT type and the tests selected.



Acquisition tab

Acquisition tab settings

Settings	Description
View Probes	View the detected probe configuration. Click **View Probes** button to view the connected probes.
Refresh sources	Updates the list of available channel sources as used by the Source fields in the Device list. Click **Refresh Sources** button if you want to change the channel connections in the test setup.

Settings		Description
Acquisition and Save options	Save all waveforms	When selected saves all the waveforms. When it executes, all waveforms will be saved.
	Delete all waveforms after analysis	Deletes all the waveforms as soon as the execution is over.
Show acquire parameters		When enabled displays the parameter name.

TekExpress DisplayPort 2.1 saves all acquisition waveforms to files by default. Waveforms are saved in a unique folder for each session (a session is started when you click the Start button). The folder path is `X:\TekExpress DisplayPort 2.0\Untitled Session\<dutid>\<date>_<time>`. Images created for each analysis, XML files with result values, reports, and other information specific to that particular execution are also saved in this folder. Saving a session moves the session file contents from the Untitled Session folder to the specified folder name and changes the session name to the specified name.

Set acquisition tab parameters

Use the Acquisitions tab in the Setup panel to view and set acquisition parameters for selected tests. Options available in the Acquisition tab are depend on the selection you are using; a live waveform or a pre-recorded waveform file.

1. In the Setup panel, click the **Acquisitions** tab.
2. When **Use pre-recorded waveform file** is selected, scroll to the Waveform FileName column in the Acquisitions table. For each acquire type row, click the ellipsis button ( ) and select the desired waveform file or files.
3. When **Acquire live waveforms** is selected , the lane and channel selection tables are displayed near the top of the tab. The selections displayed are based on the available probe setup.
   - Click **View Probes** to verify which probes are connected to which channels.
   - To refresh the probe configuration information displayed after changing any probes, click **View Probes** and then click **Refresh** in the Probe Configuration dialog box.
   - To change a lane source, click in the Source column and select a channel from the drop-down list.
4. Refer Acquisitions: Set waveform acquisition settings (on page 40) to select any other desired acquisition options.

See Also

Configuration: Set measurement limits for tests (on page 45)

About setting up tests (on page 14)

Use pre-recorded waveforms for analysis

Use pre-recorded waveform files to run a saved tests or to run a new test using a saved waveform from another test.

Refer Run a test in pre-recorded mode (on page 23) to run a saved test or new test using a pre-recorded waveform file..

1. Open a saved test setup or create a new one.

   NOTE: By using a saved test and if you do not want to overwrite the previous data, save this test setup using the Save As option before proceeding.

2. In the Setup panel, select the **DUT** tab and then select **Use pre-recorded waveform files**. (This selection adds the Waveform FileName column to the Acquisitions table in the Acquisitions tab.)
3. Change any other DUT parameters (on page 31) as desired.

4. In the Test Selection tab, select the desired test(s).
5. In the Acquisitions tab, locate the row for the desired test. In the Waveform FileName column, click the ellipsis button ( ) and then select a single waveform file or multiple waveform files.
6. Perform any additional test needed, such as test configuration (on page 45), and then click **Start**.

See Also

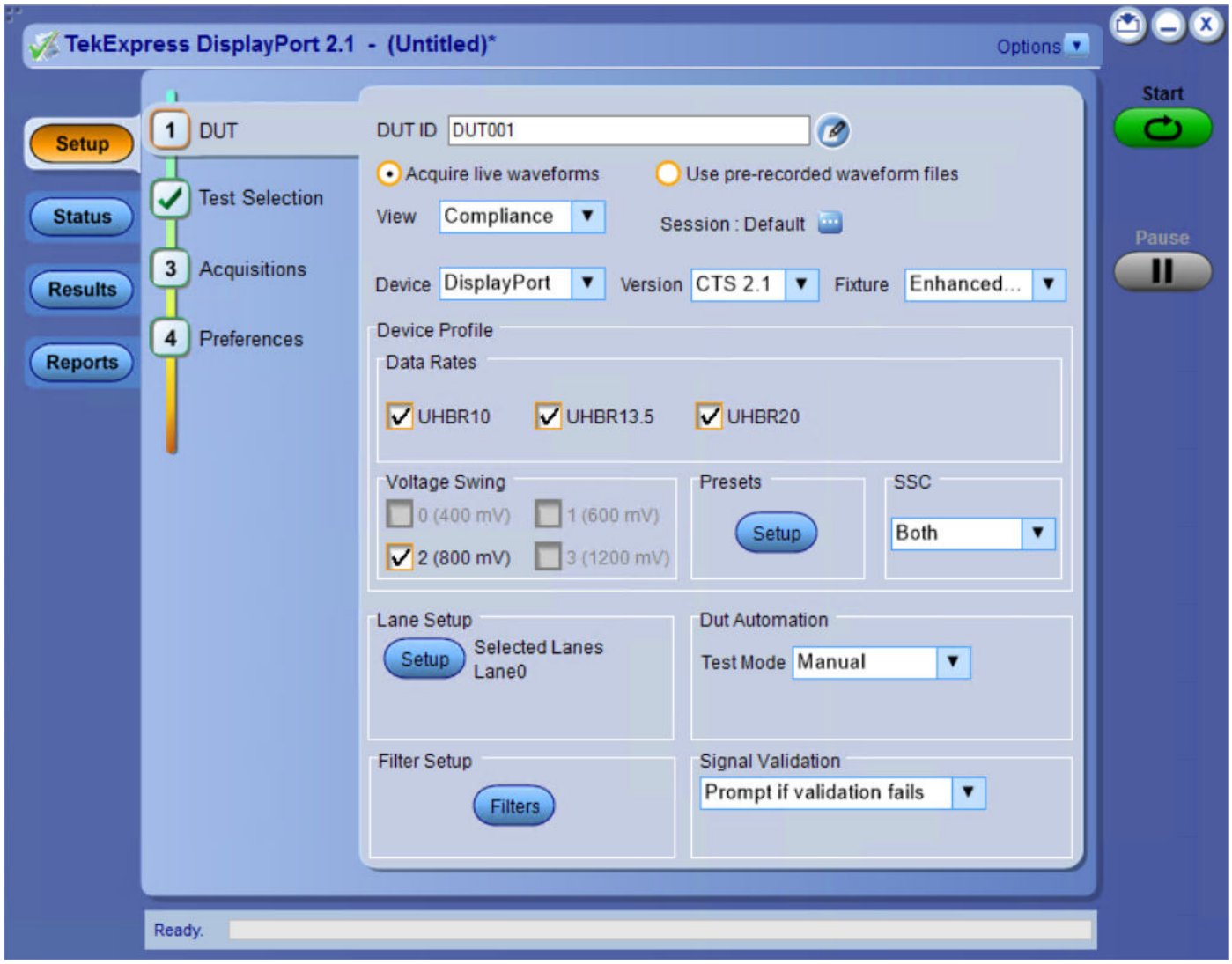
Before you click start (on page 21)

Pre-Run checklist (on page 22)

Set acquisition tab parameters (on page 41)

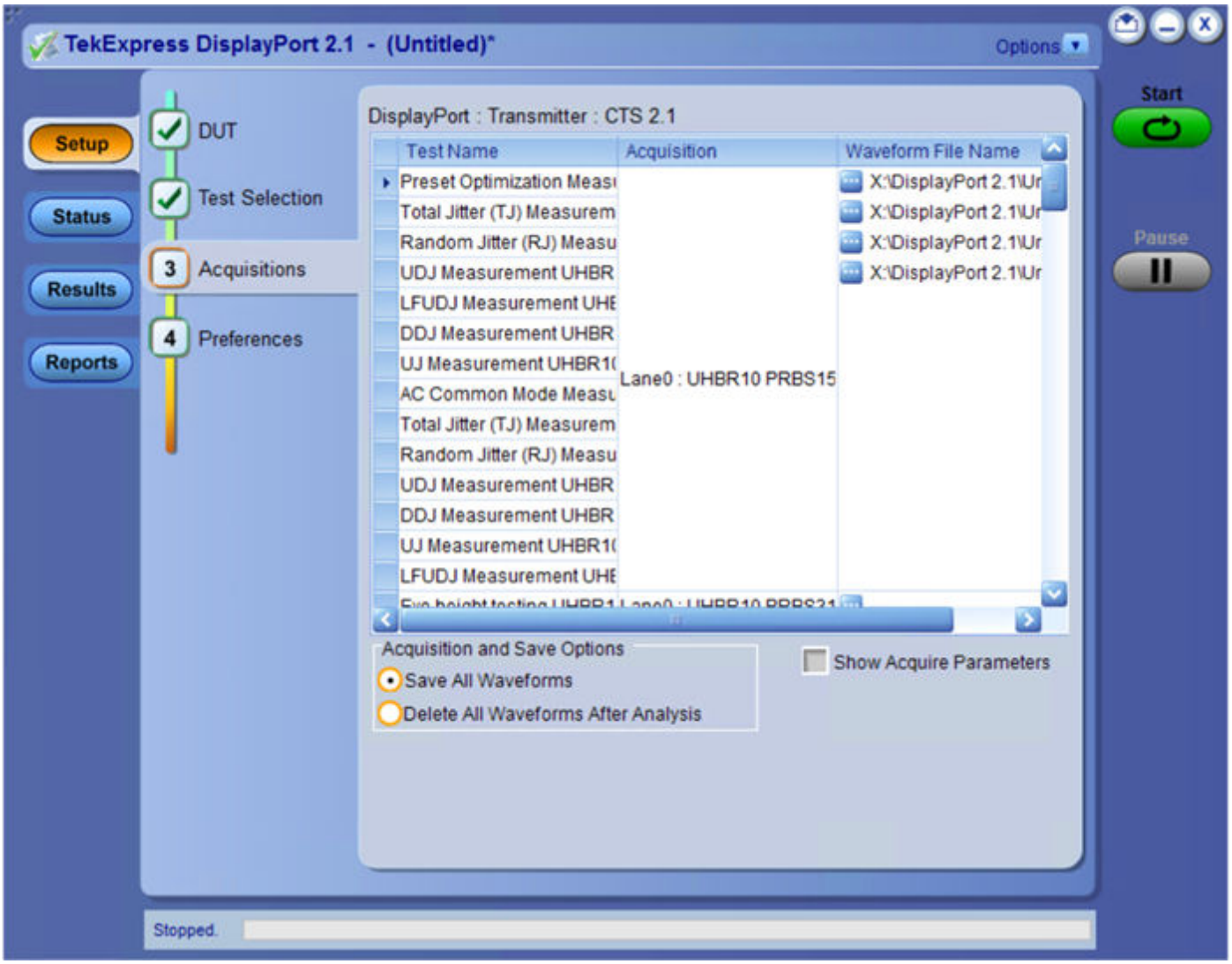
Running measurements using pre-recorded waveforms

1. In the DUT panel, select the mode as **Use pre-recorded waveform files**.

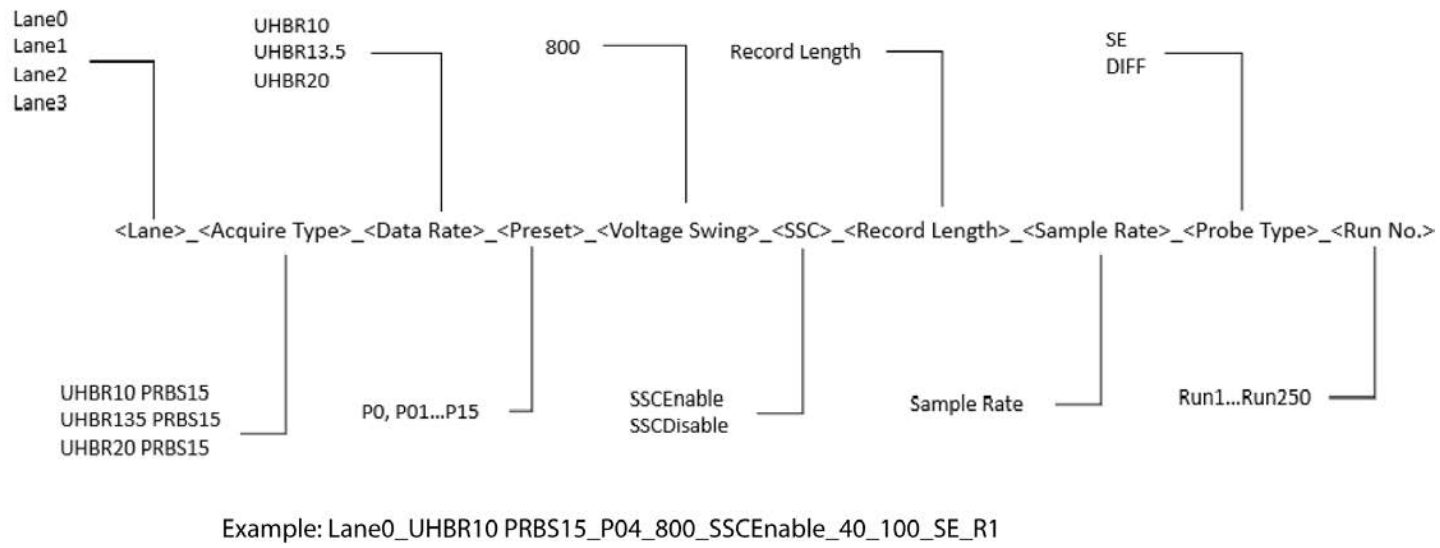


2. Select the DUT settings based on waveforms available for running measurements. Ex: If only SSC waveforms are present then you need to select SSC as **SSC Enable**.
3. Go to Test Selection panel, select desired tests which you want to run using pre-recorded waveforms.
4. Go to Acquisition panel and make sure the availability of all the desired tests.
5. Click on the icon present in 'Waveform FileName' column.

6. Make sure all the waveforms you have has proper naming convention. In case of differential signals, waveforms should have naming convention; ‘ *Lane0_UHBR10 PRBS15_UHBR10_P0_800_SSCEnable_40_100_Diff_Run1.wfm*’ and in case of single ended signals, waveforms should have naming convention; ‘*Lane0_UHBR10 PRBS15_UHBR10_P0_800_SSCEnable_40_100_SE_Run1.wfm*'. Refer point 9.
7. Select all the waveforms required for running test (In order to understand what all waveforms you have to select for running each measurement, load any existing session, and switch to pre-recorded mode then go to acquisition panel).



8. Click **Start** button.
9. If any of the tests are failed to run completely and report is not generated then cross check whether you have selected the required DUT parameters in order to run in compliance mode. In such case re-run the test by selecting appropriate DUT settings and waveforms.



Waveform naming convention

NOTE: <Run No.> is not applicable if **Number of Runs** is set to 1 in the Preference panel.

Acquire live waveforms for analysis

Follow the instructions to setup acquisition for a live waveform.

1. Load a saved test setup or Saving and recalling test setup.
2. In the Setup panel, select the **DUT** tab, enter the desired DUT ID in the corresponding field and then select **Acquire live waveforms**.
3. Select other DUT parameters (on page 31) as desired.
4. In the Test Selection tab, select the desired test(s) (on page 38).
5. In the Acquisitions tab, do any of the following that apply:
   - Select the data sources for the lanes.
   - Select other desired acquisitions parameters (on page 40).
6. Configure the tests if you have not done so already, and then click **Start** to run the test.

See Also

Set acquisition tab parameters (on page 41)

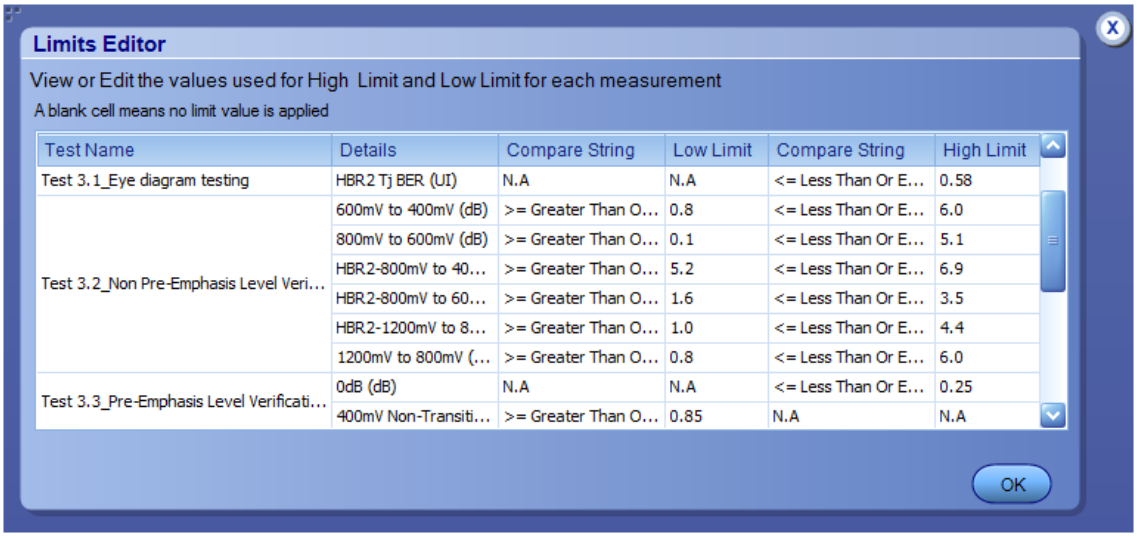
Configuration: Set measurement limits for tests (on page 45)

Configuration: Set measurement limits for tests

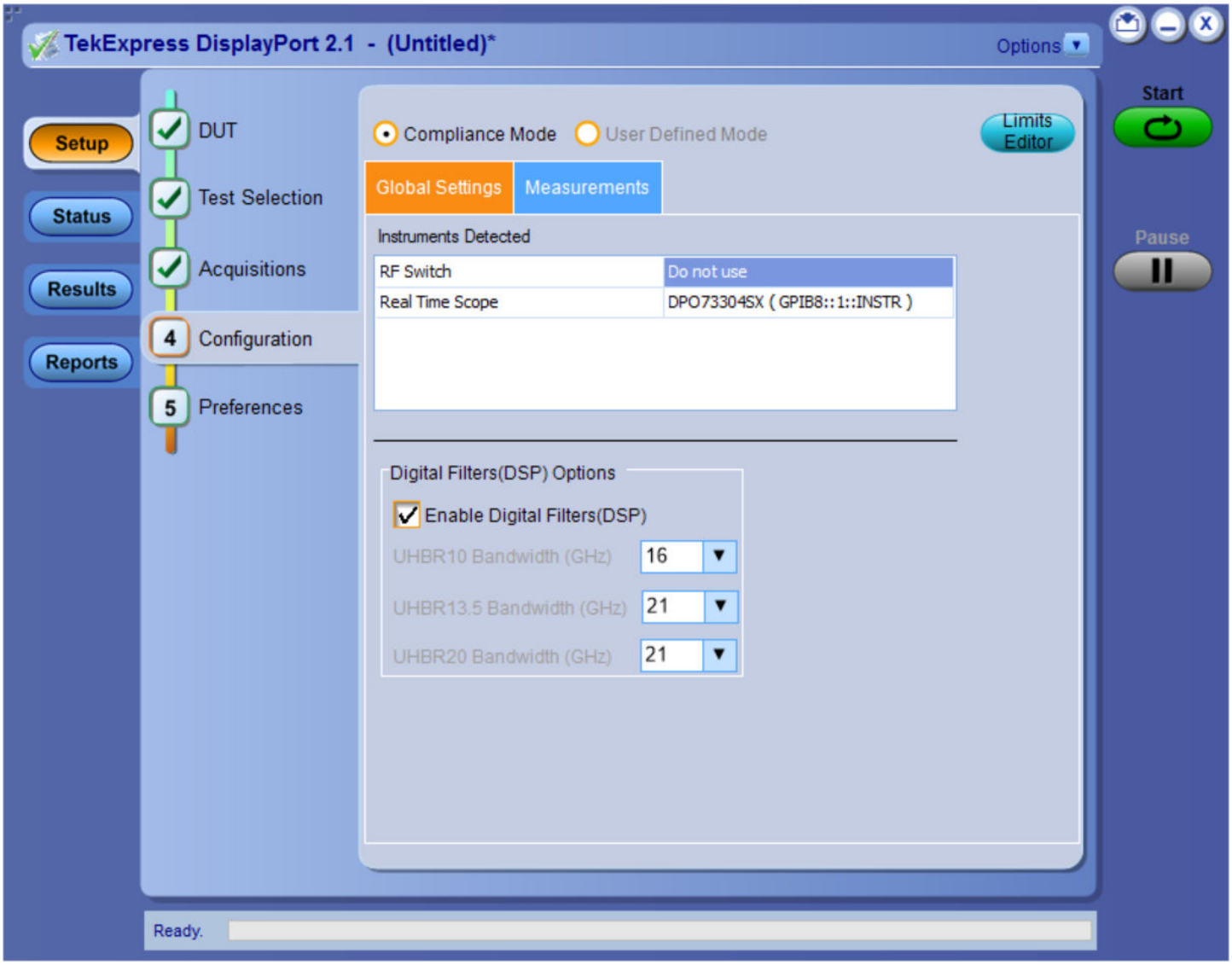
Use Configuration tab to view and configure the Global Settings and the measurement configurations. The measurement specific configurations available in this tab depends on the selections made in the DUT panel and Test Selection panel.

NOTE: Configuration tab is available only when **View** is set to **Advanced** in the DUT panel.

Configuration tab: Common parameters

Settings	Description
Limits Editor	Displays the upper and lower limits for the applicable measurement using different types of comparisons.  Limits Editor View or Edit the values used for High Limit and Low Limit for each measurement A blank cell means no limit value is applied OK

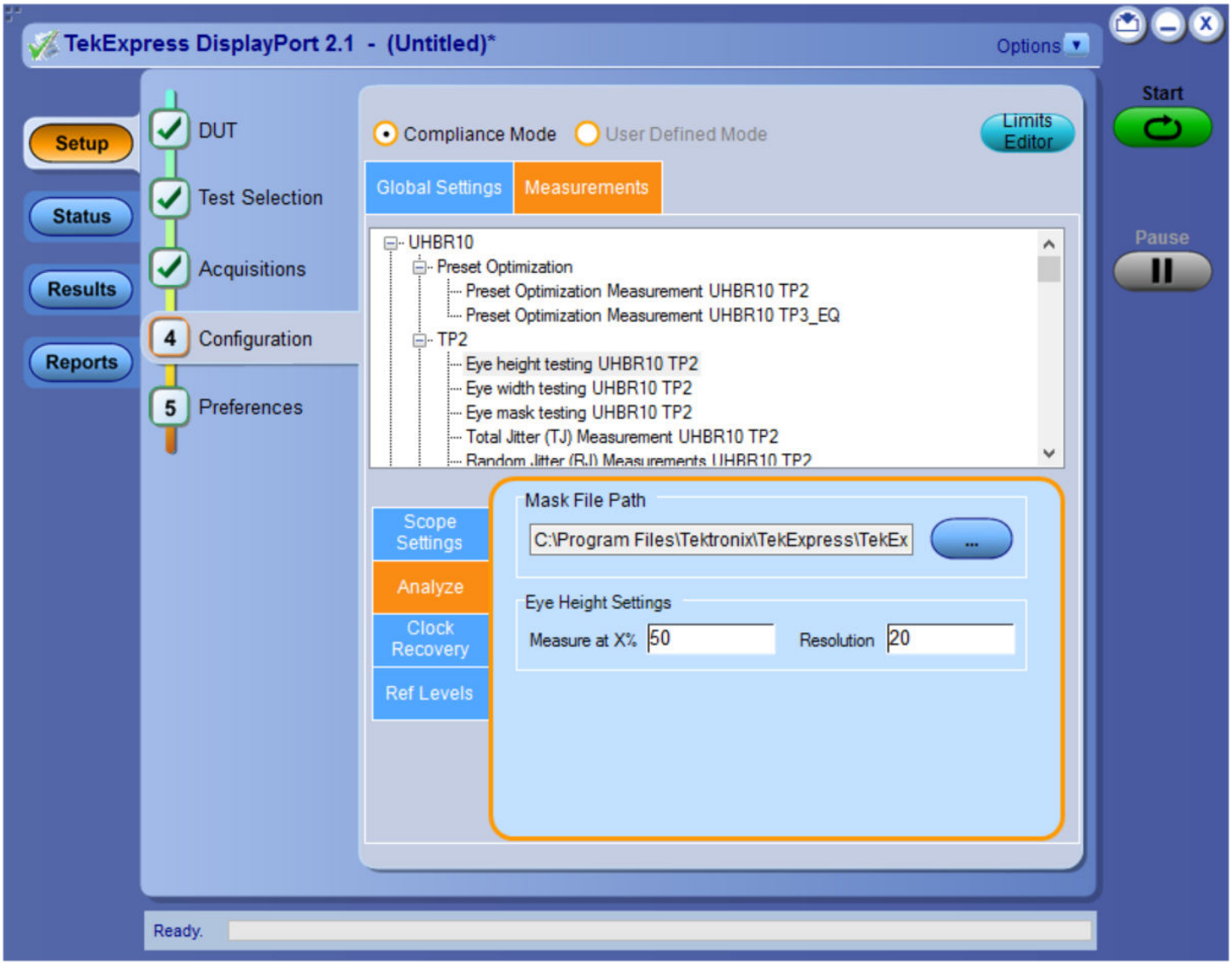
Test Name	Details	Compare String	Low Limit	Compare String	High Limit
Test 3.1_Eye diagram testing	HBR2 Tj BER (UI)	N.A	N.A	<= Less Than Or E...	0.58
Test 3.2_Non Pre-Emphasis Level Veri...	600mV to 400mV (dB)	>= Greater Than O...	0.8	<= Less Than Or E...	6.0
	800mV to 600mV (dB)	>= Greater Than O...	0.1	<= Less Than Or E...	5.1
	HBR2-800mV to 40...	>= Greater Than O...	5.2	<= Less Than Or E...	6.9
	HBR2-800mV to 60...	>= Greater Than O...	1.6	<= Less Than Or E...	3.5
	HBR2-1200mV to 8...	>= Greater Than O...	1.0	<= Less Than Or E...	4.4
	1200mV to 800mV (...	>= Greater Than O...	0.8	<= Less Than Or E...	6.0
Test 3.3_Pre-Emphasis Level Verificati...	0dB (dB)	N.A	N.A	<= Less Than Or E...	0.25
	400mV Non-Transiti...	>= Greater Than O...	0.85	N.A	N.A



Configuration tab: Global settings

Configuration tab: Global settings

Settings	Description
Instruments Detected	Displays the instruments connected to this application. Click on the instrument name to open a list of available (detected) instruments. Select **Options** > **Instrument Control Settings** and click Refresh to update the instrument list. **NOTE:** Verify that the **LAN** and **GPIB** search criteria (default setting) in the **Instrument Control Settings** is selected when using TekExpress DisplayPort 2.1 application.
Digital Filter (DSP) Options	
Enable Digital Filters (DSP)	Allows you to restrict the bandwidth of the instrument (70 GHz).



Configuration tab: Measurement settings

Configuration tab: Measurement settings

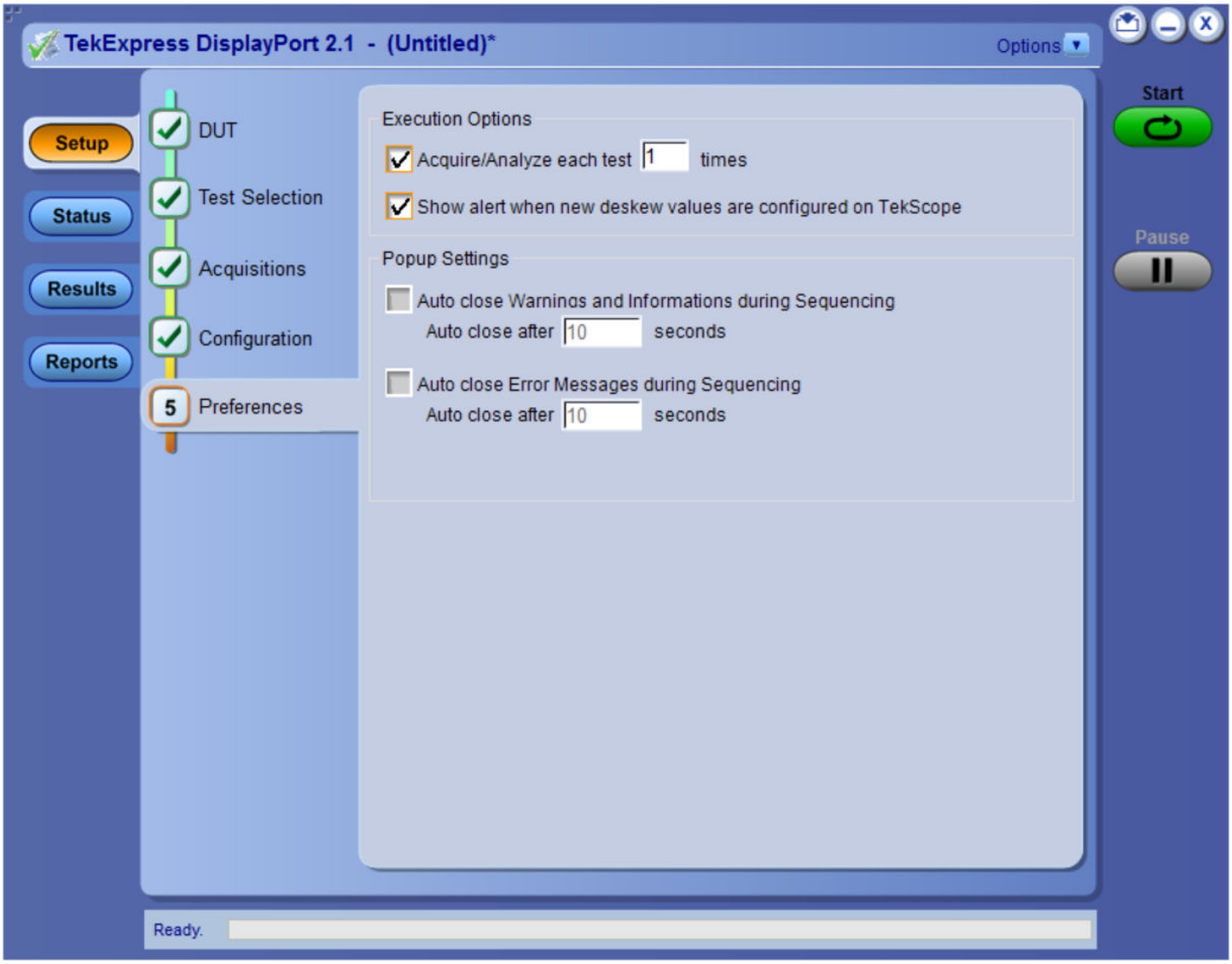
Settings	Description
Measurements	Displays the measurement groups, that are selected in the Test Selection tab. Select the respective test group to view or modify the measurement configuration.
Scope settings	
Record length	Specifies the waveform record length.
Sample rate	Specifies the oscilloscope's sample rate for all tests.
Analyze	
Mask file path	Specifies the file which contains mask information.
Clock recovery	

Settings	Description
Clock recovery method	Specifies the algorithm to use to recover the clock
PLL model	Defines the order of PLL
Damping (m)	Second parameter used for TYPE-II PLL
Loop BW (MHz)	Loop bandwidth is the Bandwidth of the PLL
Ref levels	Timing measurements are based on the state transition times. Edges occur when a waveform crosses the specified reference voltage levels. Set the reference voltage levels, that the application can identify state transitions on a waveform. By default, the application automatically chooses reference voltage levels when necessary.
Mid level	Sets the middle threshold level for the rising and falling edge of the source.
Hysteresis	Hysteresis sets the threshold margin to the reference level. The voltage must cross to be recognized as changing; the margin is the relative reference level plus or minus hysteresis, use to filter out spurious events.
Ref levels autoset basetop Method	Specifies the Base-Top method, used for all reference voltage levels when auto set occurs. ▪ Auto ▪ MINMAX ▪ FULLHISTOGRAM ▪ EYEHISTOGRAM

NOTE: The **Absolute** and **Percentage** settings in the Reference level are not available.

Preferences: Set the test run preferences

Use **Preferences** tab to set the application action on completion of a measurement. The **Preferences** tab has the feature to enable or disable certain options related to the measurement execution.



Preference tab

Refer the below table for the options available in the **Preferences** tab:

Preferences tab settings

Setting	Description
Execution Options	
Acquire/Analyze each test <no> times (not applicable to Custom Tests)	Select to repeat the test run by setting the number of times. By default, check box is disabled. Upon enabling, the default value is 10.
Deskew	

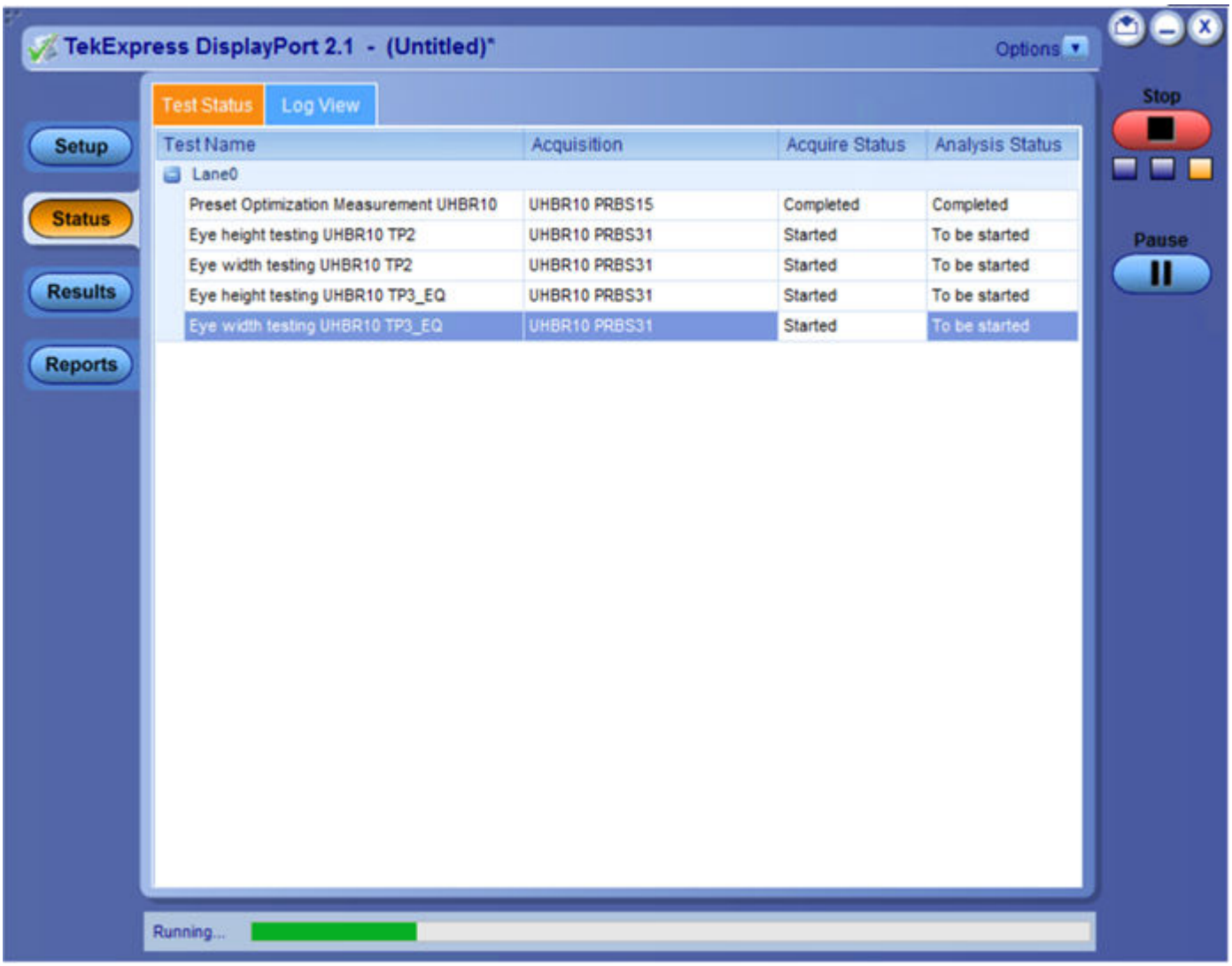
Setting	Description
Show alert when new deskew values are configured on TekScope	Select to display the alert when new deskew values are configured on TekScope.
Popup Settings	
Auto close Warnings and informations during Sequencing Auto close after <no> seconds	Select to close the warnings and information window automatically after the specified amount of time. Specify the time in seconds using the edit box.
Auto close Error Messages during Sequencing. Show in Reports Auto close after <no> seconds	Select to close the error message window automatically after the specified amount of time. Specify the time in seconds using the edit box.

Status panel: View the test execution status

The Status panel contains the **Test Status** and **Log View** tabs, which provides status on the test acquisition and analysis (Test Status) and listing of test tasks performed (Log View tab). The application opens the **Test Status** tab when you start to execute the test. Select the **Test Status** or the **Log View** tab to view these items while the test execution is in progress.

View test execution status

The tests are grouped and displayed based on the Clock and Data lane. It displays the tests along with the acquisition type, acquire, and analysis status of the tests. In pre-recorded mode, **Acquire Status** is not valid.



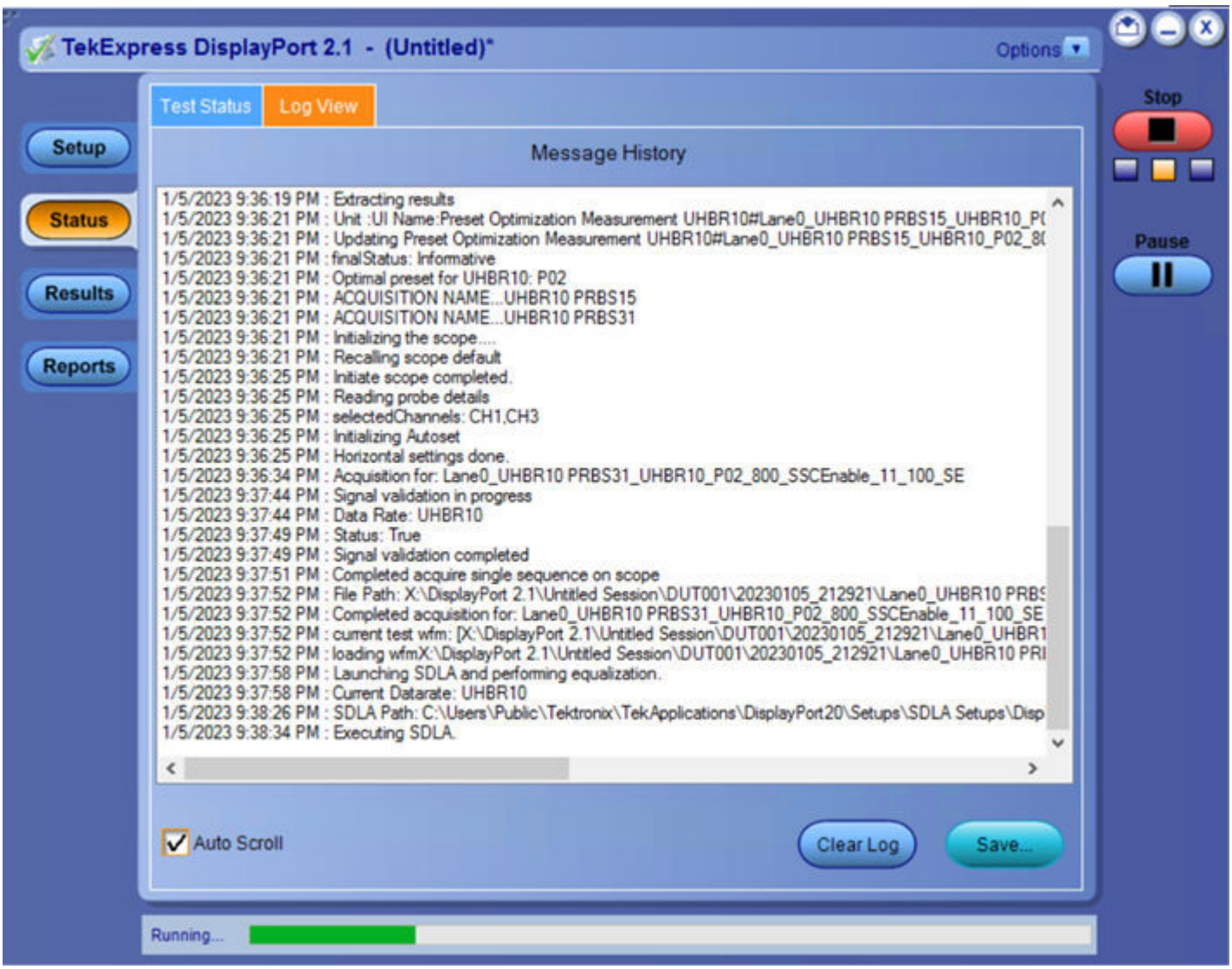
Test execution status view in Status panel

Test execution status table headers

Control	Description
Test Name	Displays the measurement name.
Acquisition	Describes the type of data being acquired.
Acquire Status	Displays the progress state of the acquisition: ▪ To be started ▪ Started Acquisition ▪ Completed Acquisition
Analysis Status	Displays the progress state of the analysis: ▪ To be started ▪ In Progress ▪ Completed ▪ Aborted

View test execution logs

The Test Status tab displays the detailed execution status of the tests. Also, displays each and every execution step in detail with its timestamp information. The log details can be used to troubleshoot and resolve any issue/bug which is blocking the test execution process.



Log view in Status panel

Status panel settings

Control	Description
Message History	Lists all the executed test operations and timestamp information.
Auto Scroll	Enables automatic scrolling of the log view as information is added to the log during the test execution.
Clear Log	Clears all the messages from the log view.
Save	Saves the log file into a text file format. Use the standard Save File window to navigate to and specify the folder and file name to save the log text.

Results panel: View summary of test results

When a test execution is complete, the application automatically opens the **Results** panel to display a summary of test results.

In the Results table, each test result occupies a row. By default, results are displayed in summary format with the measurement details collapsed and with the Pass/Fail column visible.

Results panel with measurement results

Click icon on each measurement in the row to expand and to display the minimum and maximum parameter values of the measurement.

Filter the test results

Each column in the result table can be customized and displayed by enabling or disabling any column as per your requirement. You can change the view in the following ways:

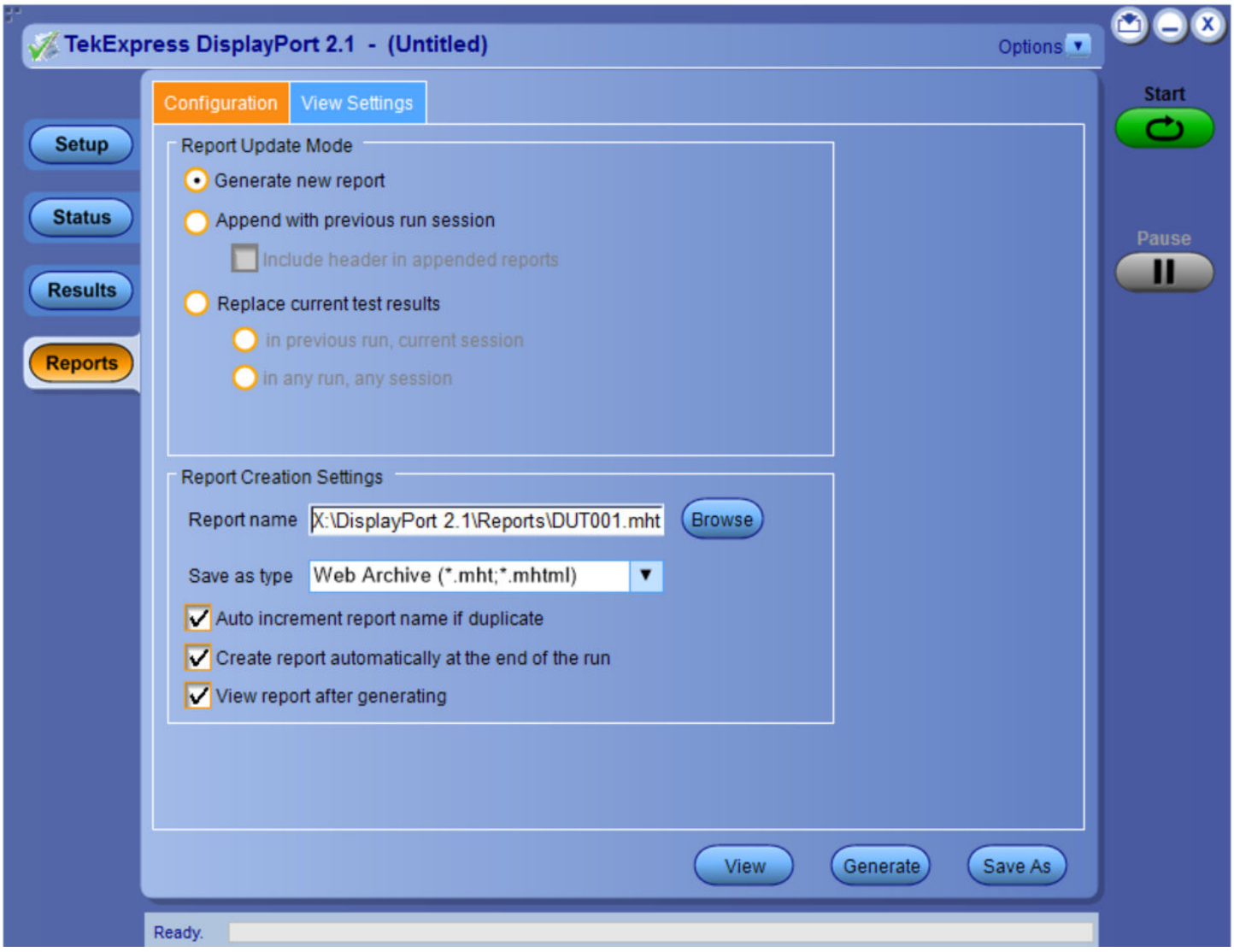
- To remove or restore the Pass/Fail column, select **Preferences**→ **Show Pass/Fail**.
- To collapse all expanded tests, select **Preferences**→ **View Results Summary**.
- To expand all the listed tests, select **View Results Details** from the **Preferences menu** in the upper right corner.
- To enable or disable the wordwrap feature, select **Preferences**→ **Enable Wordwrap**.
- To view the results grouped by lane or test, select the corresponding item from the **Preferences** menu.
- To expand the width of a column, place the cursor over the vertical line that separates the column from the column to the right. When the cursor changes to a double-ended arrow, hold down the mouse button and drag the column to the desired width.
- To clear all test results displayed, click **Clear**.

Reports panel: Configure report generation settings

Click **Reports** panel to configure the report generation settings and select the test result information to include in the report. You can use the Reports panel to configure report generation settings, select test content to include in reports, generate the report, view the report, browse for reports, name and save reports, and select report viewing options.

Report configuration settings

The Configuration tab describes the report generation settings to configure the Reports panel. Select report settings before running a test or when creating and saving test setups. Report settings configured are included in saved test setups.



Report panel- Configuration tab

Report configuration panel settings

Control	Description
Report Update Mode Settings	
Generate new report	Each time when you click Run and when the test execution is complete, it will create a new report. The report can be in either .mht, .pdf, or .csv file formats.
Append with previous run session	Appends the latest test results to the end of the current test results report. Each time when you click this option and run the tests, it will run the previously failed tests and replace the failed test result with the new pass test result in the same report.
Include header in appended reports	Select to include header in appended reports.
Replace current test in previous run session	Replaces the previous test results with the latest test results. Results from newly added tests are appended to the end of the report.
In previous run, current session	Select to replace current test results in the report with the test result(s) of previous run in the current session.
In any run, any session	Select to replace current test results in the report with the test result(s) in the selected run session's report. Click and select test result of any other run session.
Report Creation Settings	
Report name	Displays the name and path of the <Application Name> report. The default location is at \My Documents>\My TekExpress\<Application Name>\Reports. The report file in this folder gets overwritten each time you run a test unless you specify a unique name or select to auto increment the report name. **To change the report name or location, do one of the following:** • In the Report Path field, type the current folder path and name. • Double-click in the Report Path field and then make selections from the popup keyboard and click **Enter**. Be sure to include the entire folder path, the file name, and the file extension. For example: C:\Documents and Settings\your user name\My Documents\My TekExpress\<Application Name> \DUT001.mht. **Note**: You cannot set the file location using the Browse button. Open an existing report Click **Browse**, locate and select the report file and then click **View** at the bottom of the panel.
Save as type	Saves a report in the specified file type, selected from the dropdown list. The report is saved in .csv, .pdf, or .mht. **NOTE:** If you select a file type different from the default, be sure to change the report file name extension in the Report Name field to match.
Auto increment report name if duplicate	Sets the application to automatically increment the name of the report file if the application finds a file with the same name as the one being generated. For example: DUT001, DUT002, DUT003. This option is enabled by default.

Control	Description
Create report automatically at the end of the run	Select to create the report with the settings configured, at the end of run.
View report after generating	Automatically opens the report in a Web browser when the test execution is complete. This option is selected by default.

Configure report view settings

The **View Settings** tab describes the report view settings to configure the Reports panel. Select report view settings before running a test or when creating and saving test setups. Report settings configured are included in saved test setups.

Report panel-View settings tab

Report panel view setting

Control	Description
Contents to Save Settings	
Include pass/fail info in details table	Select to include pass/fail information in the details table of the report.
Include detailed results	Select to include detailed results in the report.
Include plot images	Select to include the plot images in the report.
Include setup configuration	Sets the application to include hardware and software information in the summary box at the top of the report. Information includes: the oscilloscope model and serial number, the oscilloscope firmware version, and software versions for applications used in the measurements.
Include complete application configuration	Select to include the complete application configuration in the report.
Include user comments	Select to include any comments about the test that you or another user have added in the DUT tab of the Setup panel. Comments appear in the Comments section, below the summary box at the beginning of each report.
Include statics table	Select to include test run statistics in the report. This is enabled when you run any test for more than once. Set Acquire/Analyze each test in the Preferences tab to more than one, to run any test for multiple times.
Include Informative Results	Select to include results for informative tests.
Group Report By Settings	
Test Name	Select to group the test results based on the test name in the report.
Test Result	Select to group the test results based on the test result in the report.
Lane Name	Select to group the test results based on the Lanes in the report.
Data Rate	Select to group the test results based on the Data Rate in the report.
Images	Select to group the test results based on the images in the report.
Report Type Settings	
Compliance	Select to include compliance results only.
All Results	Select to include all results.

Other Report Panel settings

Control	Description
View	Click to view the most current report.
Generate Report	Generates a new report based on the current analysis results.

Control	Description
Save As	Specify a name for the report.

View a generated report

Sample report and its contents

A report shows detailed results and plots, as set in the Reports panel.

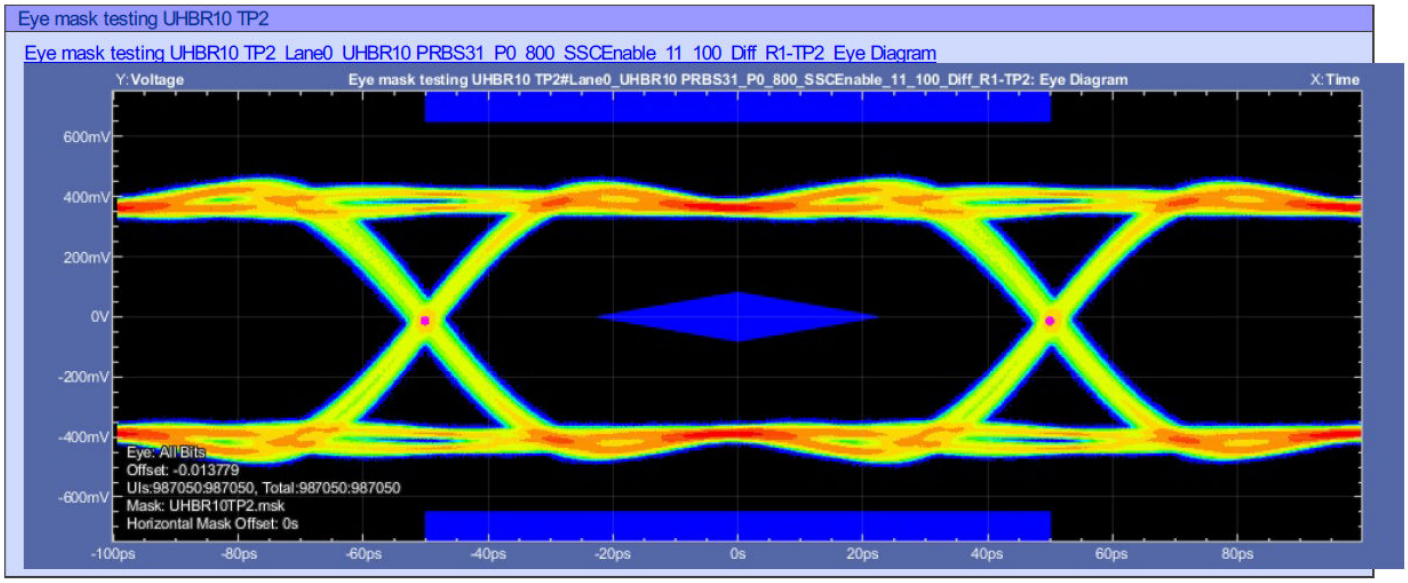
TekExpress Display Port Tx 2.1

Transmitter Test Report

Setup Information			
DUT ID	DUT001	DPOJET Version	"10.6.3.44"
Optimal Presets	N/A	Scope Model	DPO73304SX
Date/Time	6/1/2026 1:50:27 AM	Scope Serial Number	PQ100004
Device Type	DisplayPort	Scope Version	CF:91.1CT FV:10.14.1 Build 15
CTS Version	CTS 2.1	SDLA Version	3.0.13.62
Fixture	Enhanced DP		
Test Mode	Compliance		
DUT Control	Manual		
SSC	Both		
TekExpress Version	Framework: 5.12.0.22		
App Version	Display Port Tx 2.1: 10.5.2.2		
Execution Mode	Pre-Recorded		
Analysis Duration	00:03:56		
Overall Execution Duration	00:03:57		
Overall Test Result	Pass		
DUT COMMENT:	General Comment - DisplayPort		

Test Name Summary Table	
Eye height testing UHBR10 TP2	Pass
Eye width testing UHBR10 TP2	Pass
Eye mask testing UHBR10 TP2	Pass
Total Jitter (TJ) Measurement UHBR10 TP2	Pass
Random Jitter (RJ) Measurements UHBR10 TP2	Informative
UDJ Measurement UHBR10 TP2	Pass
LFUDJ Measurement UHBR10 TP2	Pass
DDJ Measurement UHBR10 TP2	Informative
UJ Measurement UHBR10 TP2	Pass
SSC Phase Deviation Measurement UHBR10 TP2	Pass
SSC Down Spread Rate Measurement UHBR10 TP2	Pass
SSC Down Spread Range Measurement UHBR10 TP2	Pass
SSC Slew Rate Measurement UHBR10 TP2	Pass
UI Measurement UHBR10 TP2	Informative
Bit Rate Measurement UHBR10 TP2	Pass
Total Measurements Executed : 19 : Pass = 15 : Fail = 0 : Skipped = 0 : Error = 0 : Informative = 4	

Sample report



Eye diagram

Setup Information	The summary box at the beginning of the report lists setup configuration information. This information includes the oscilloscope model and serial number, optical module model and serial number, and software version numbers of all associated applications.
User comments	If you had selected to include comments in the test report, any comments you added in the DUT tab are shown at the top of the report.
Test Name Summary Table	The test summary table lists all the tests which are executed with its result status.
Optimum CTLE Table Measurement(s)	The measurement table displays the measurement related details with its parameter value.
Plot	Any Plot associated to the measurements excuted

Saving and recalling test setup

Overview

You can save the test setup and recall it later for further analysis. Saved setup includes the selected oscilloscope, general parameters, acquisition parameters, measurement limits, waveforms (if applicable), and other configuration settings. The setup files are saved under the setup name at X:\Display Port 2.1

Name	Date modified	Type
1-LP_20210331_210911	3/31/2021 9:06 PM	File folder
1-LP_20210331_220738	3/31/2021 10:05 PM	File folder
1-LP_20210331_223715	3/31/2021 10:35 PM	File folder
1-LP_20210331_224851	3/31/2021 10:48 PM	File folder
1-LP_20210331_230337	3/31/2021 11:02 PM	File folder
1-LP_20210331_230921	3/31/2021 11:08 PM	File folder

Example of Test Setup File

Use test setups to:

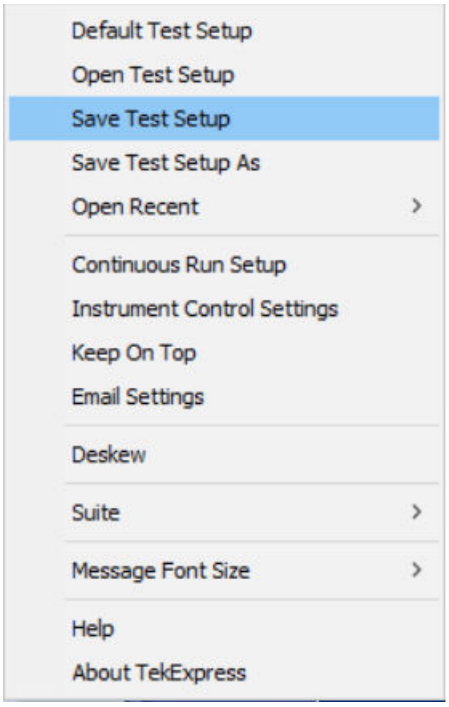
- Recall a saved configuration.
- Run a new session or acquire live waveforms.
- Create a new test setup using an existing one.
- View all the information associated with a saved test, including the log file, the history of the test status as it executed, and the results summary.
- Run a saved test using saved waveforms.

NOTE: Images that are shown in this Saving and recalling test setup chapter are for illustration purpose only and it may vary depending on the TekExpress application.

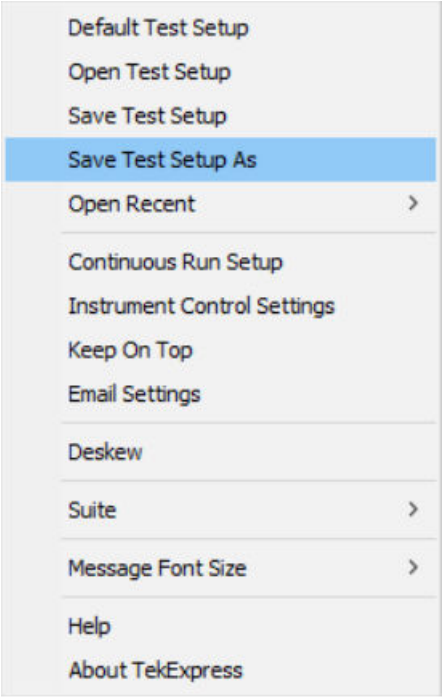
Save the configured test setup

You can save a test setup before or after running a test. You can create a test setup from already created test setup or using a default test setup. When you save a setup, all the parameters, measurement limits, waveform files (if applicable), test selections, and other configuration settings are saved under the setup name. When you select the default test setup, the parameters are set to the application's default value.

- Select **Options > Save Test Setup** to save the opened setup.



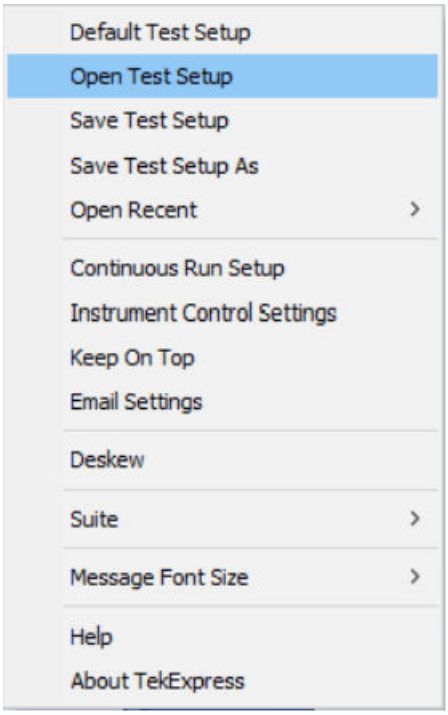
- Select **Options> Save Test Setup As** to save the setup with different name.



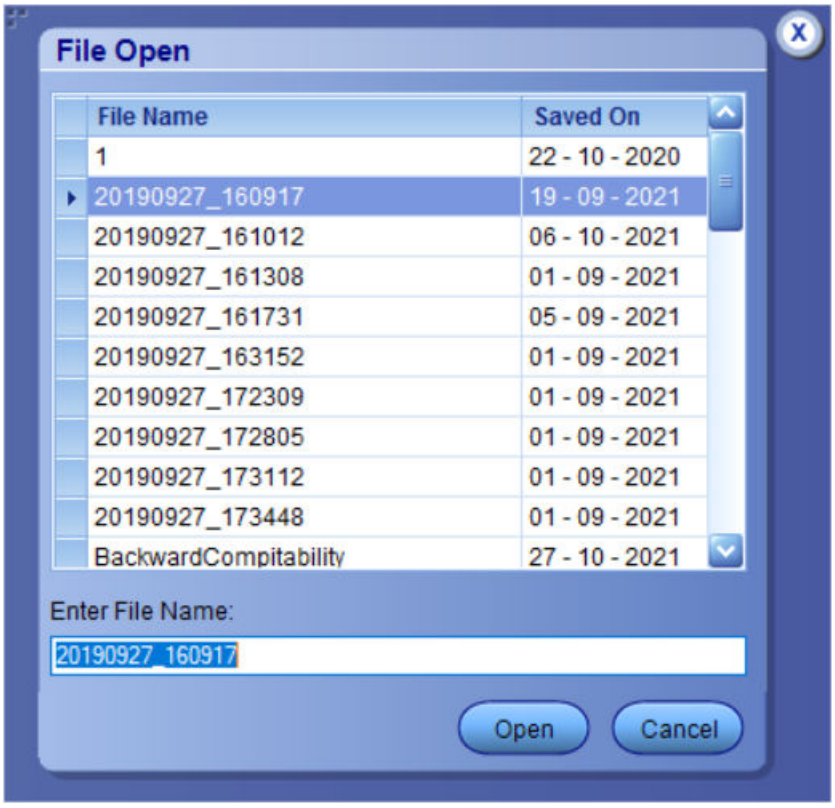
Load a saved test setup

To open (load) a saved test setup, do the following:

- Select **Options> Open Test Setup**.



- From the **File Open** menu, select the setup file name from the list and click **Open**.

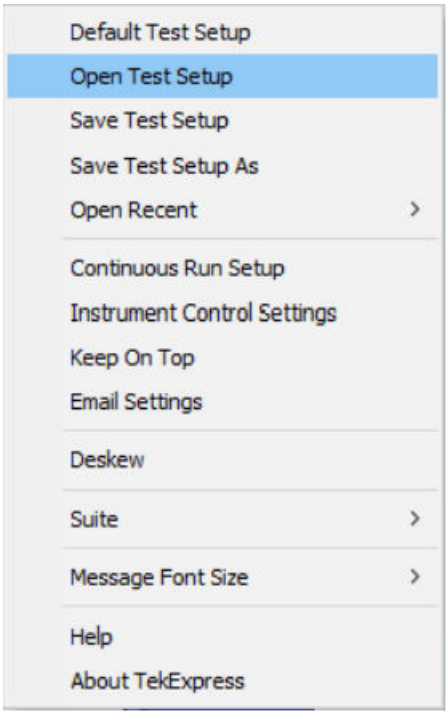


NOTE: Parameters that are set for the respective test setup will enable after opening the file.

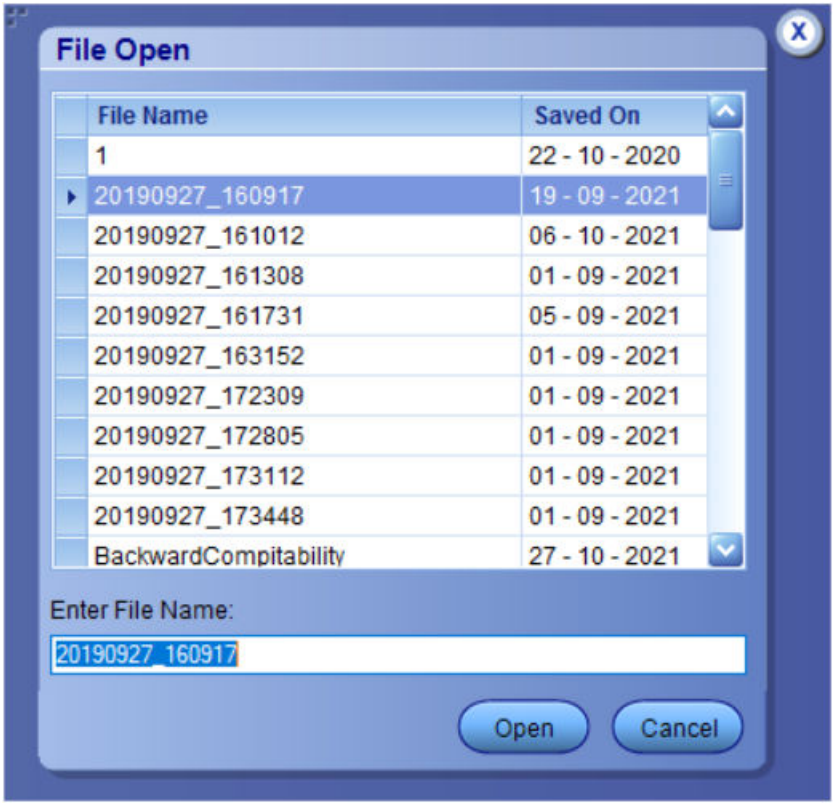
Perform a test using pre-run session files

Complete the following steps to load a test setup from a pre-run session:

1. Select **Options> Open Test Setup**.

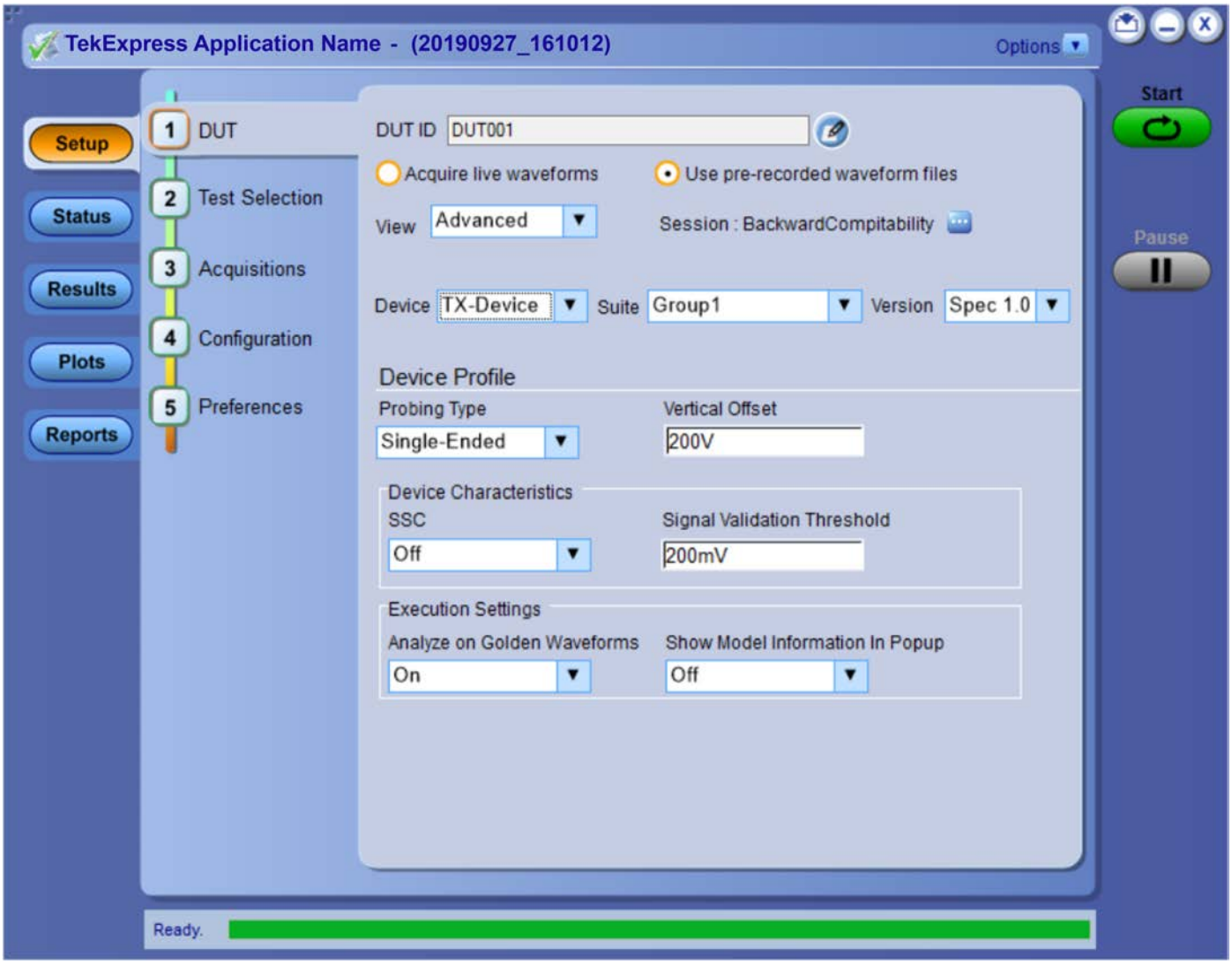


2. From the **File Open** menu, select a setup from the list and then click **Open**.

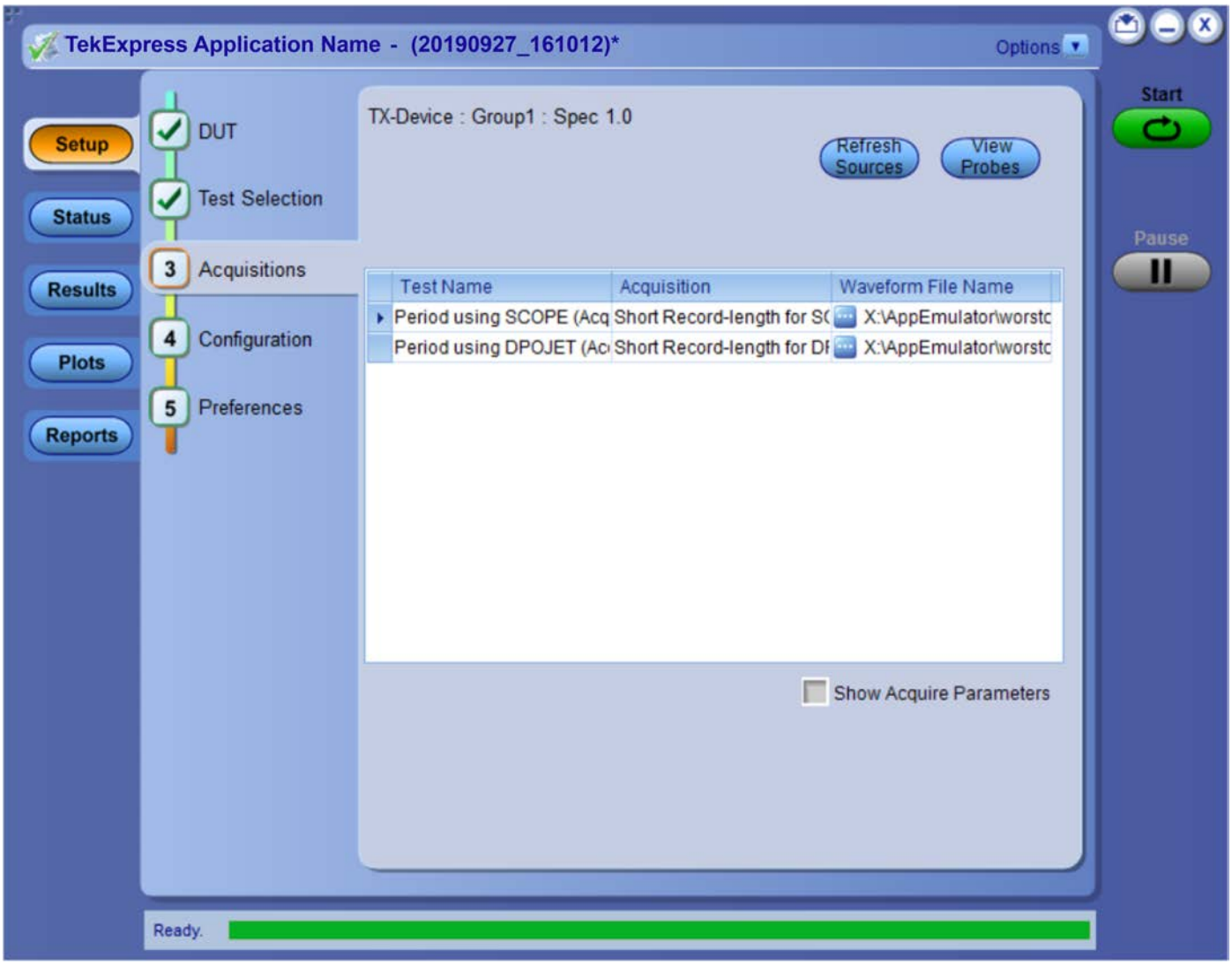


NOTE: Parameters that are set for the respective test setup will enable after opening the file.

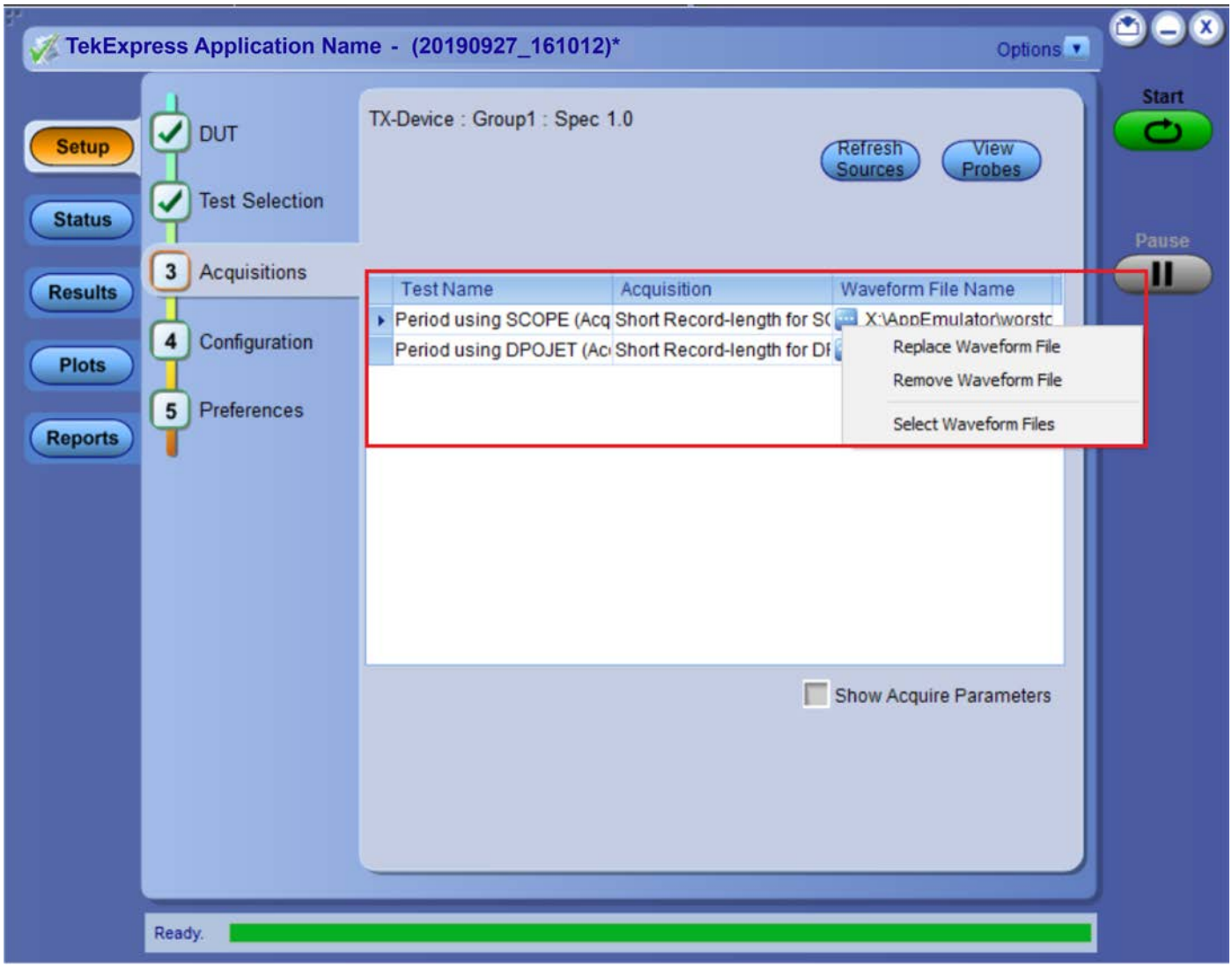
3. Switch the mode to **Use Pre-recorded waveform files** in the DUT panel.


TekExpress Application Name - (20190927_161012)
Options
Start
Pause
Setup
Status
Results
Plots
Reports
1 DUT
2 Test Selection
3 Acquisitions
4 Configuration
5 Preferences
DUT ID
DUT001
Acquire live waveforms
Use pre-recorded waveform files
View
Advanced
Session : BackwardCompitability
Device
TX-Device
Suite
Group1
Version
Spec 1.0
Device Profile
Probing Type
Single-Ended
Vertical Offset
200V
Device Characteristics
SSC
Off
Signal Validation Threshold
200mV
Execution Settings
Analyze on Golden Waveforms
On
Show Model Information In Popup
Off
Ready.

4. Select the required waveforms from the selected setup in the **Acquisitions** tab and click **Start**.



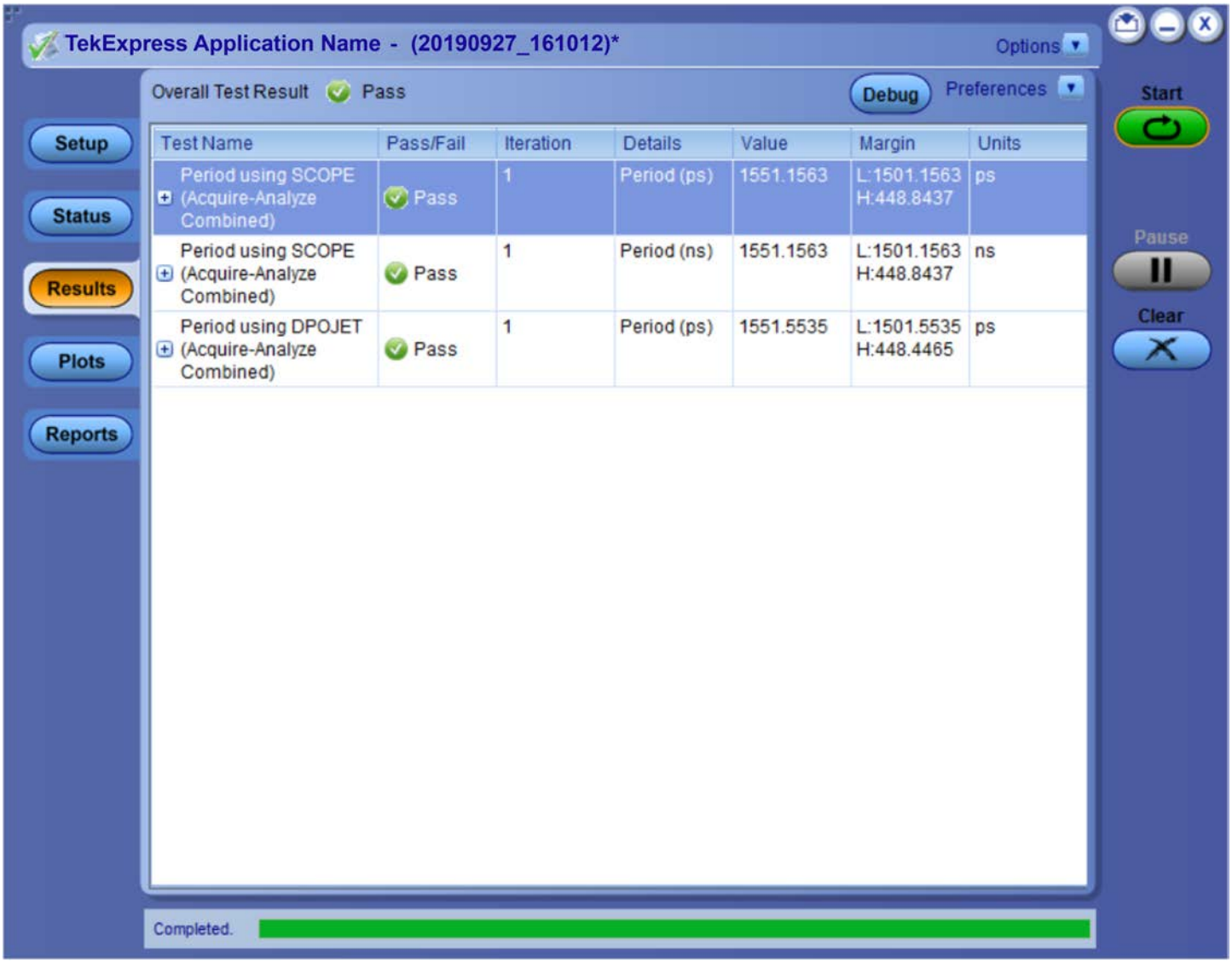
5. The selected waveform file can be removed/replaced by clicking on the ( ) icon.



6. After successful completion of the test, the waveform report files are stored at **X:\<Application Name>\Reports**.

Name	Date modified	Type
DUT001_2266.mht	10/27/2021 4:25 AM	MHTML Document
DUT001_2265.mht	10/27/2021 1:24 AM	MHTML Document
DUT001_2264.mht	10/6/2021 2:58 AM	MHTML Document
DUT001_2263.mht	10/6/2021 2:40 AM	MHTML Document
DUT001_2262.mht	10/6/2021 2:35 AM	MHTML Document
DUT001_2261.mht	10/6/2021 2:23 AM	MHTML Document

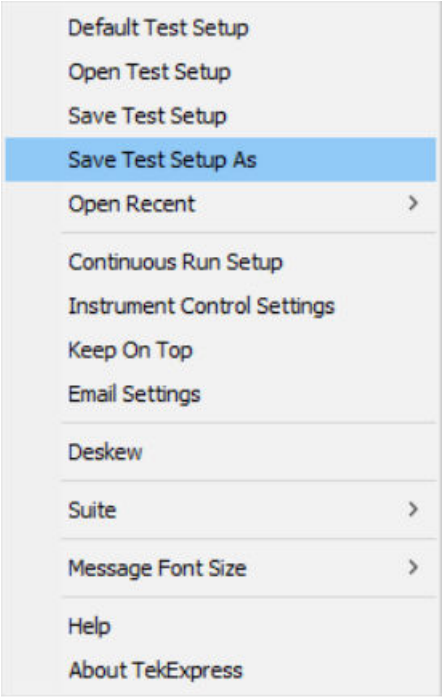
7. The overall test result status after completion of the test execution is displayed in the Results Panel.



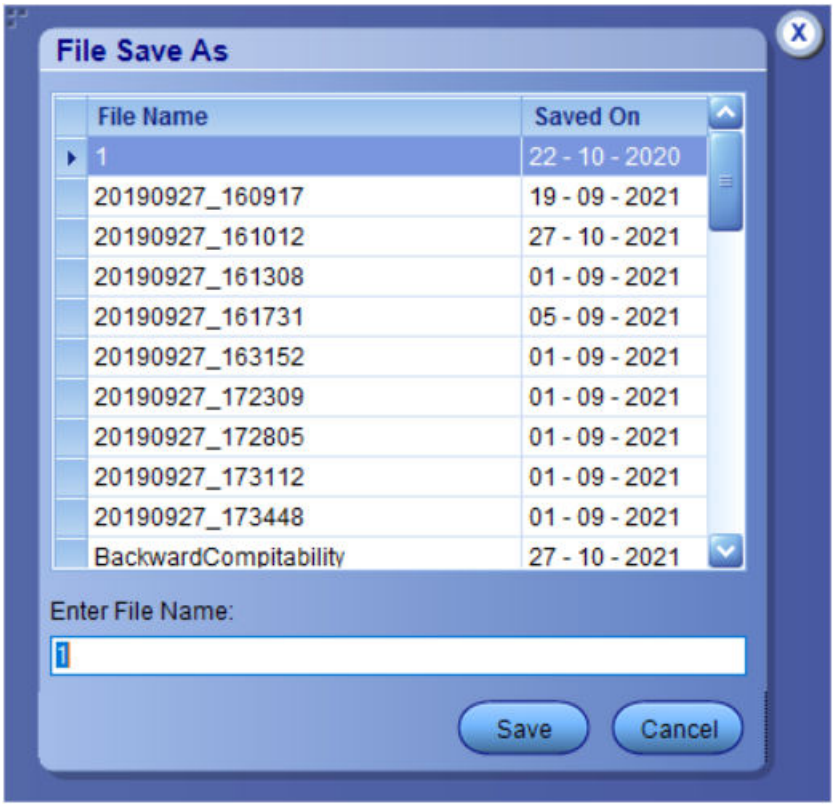
Save the test setup with a different name

To save a test setup with a different name, follow the steps:

1. Select **Options> Save Test Setup As**.



2. Enter the new test setup name and click **Save**.



Introduction to Tektronix DP DUT control app

This section describes the functionality and usage of Tektronix DP DUT control application using Unigraf DPR-100 and UCD-323 controller devices.

Software requirements

The software requirements are:

- Tektronix Oscilloscope with TekExpress DisplayPort 2.1 Application.
- Unigraf DPR-100 or UCD-323 Reference Sink device.
- GRL-USB-PD (required for only Type-C connector testing)

Purpose of the application

The Tektronix DP DUT Control App is used to test:

- DP 1.4 DUTs using DPR-100
- DP 1.4 and DP 2.1 DUTs using UCD-323

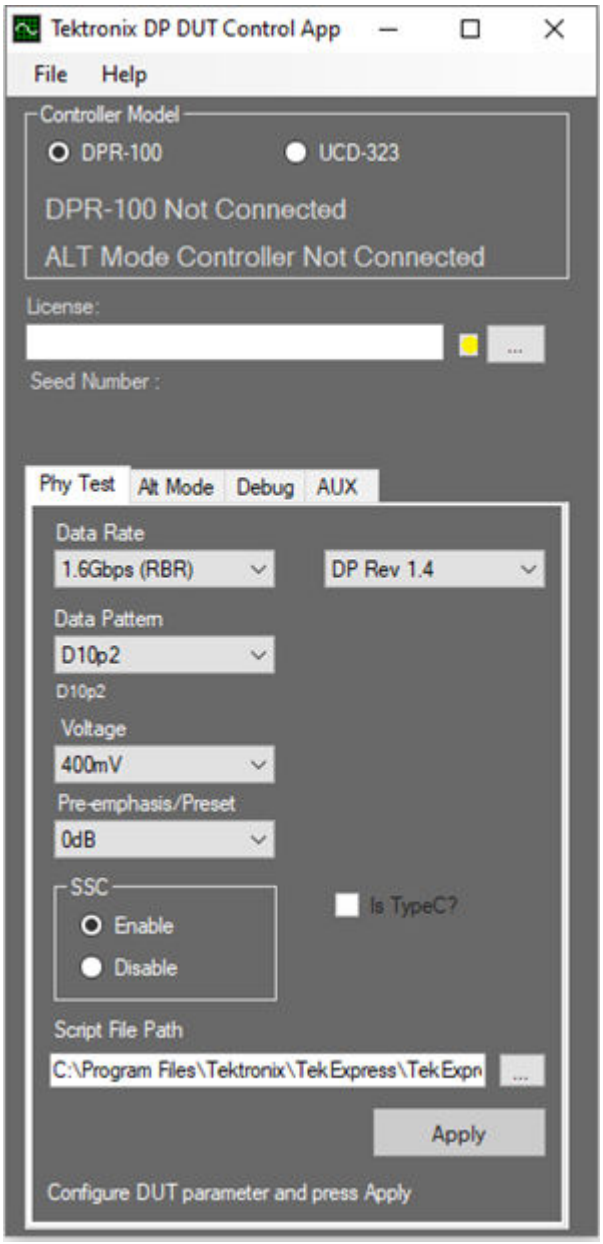
Install the software

The Tektronix DP DUT Control App and the device drivers will be installed along with TekExpress DisplayPort Tx 2.1 application.

Run the application

To run the application:

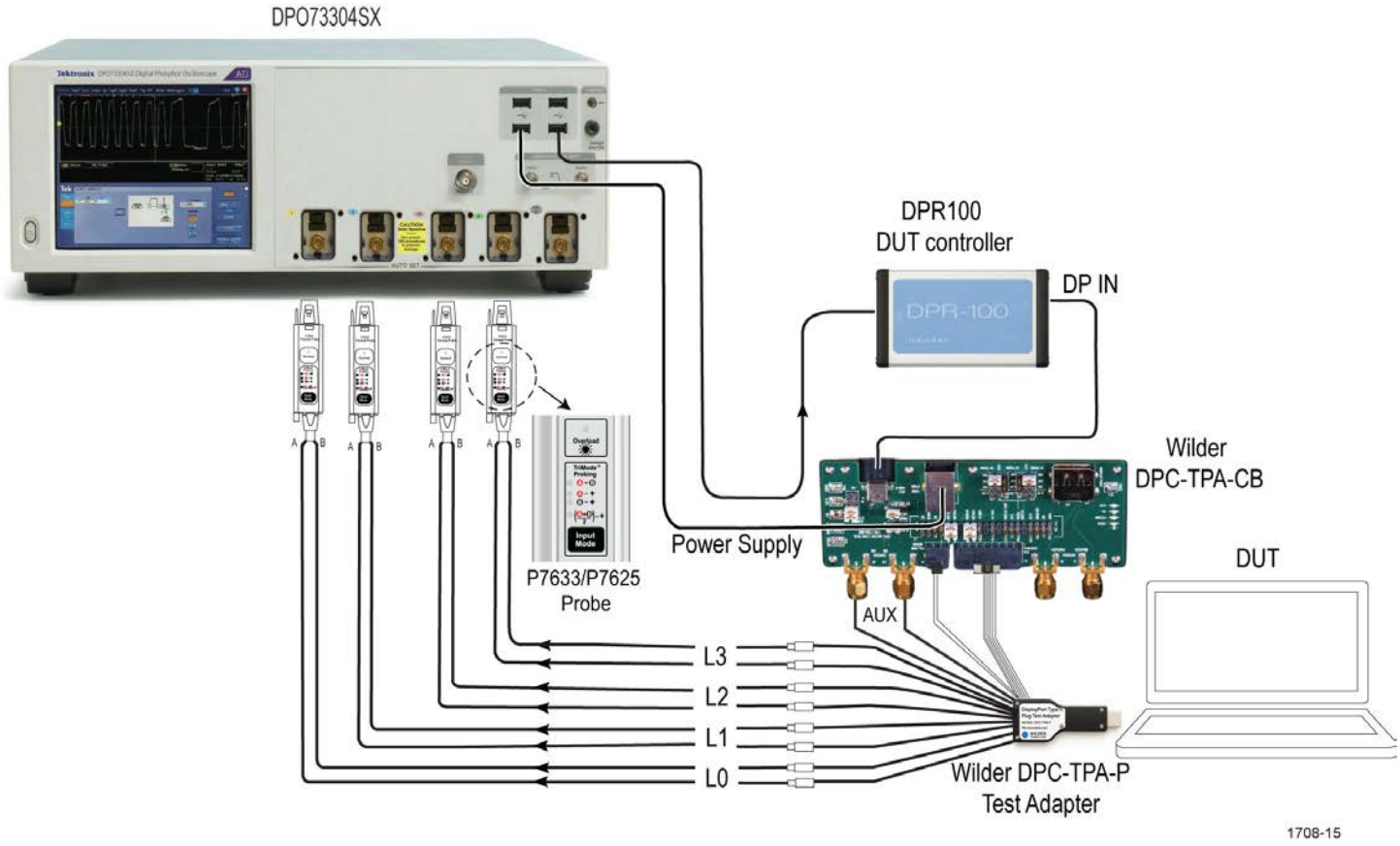
1. Click the executable file DPUnigrafControllerApplication.exe. The exe launches the application.
2. Select DPR-100 or UCD-323 radio button to choose the device to use.



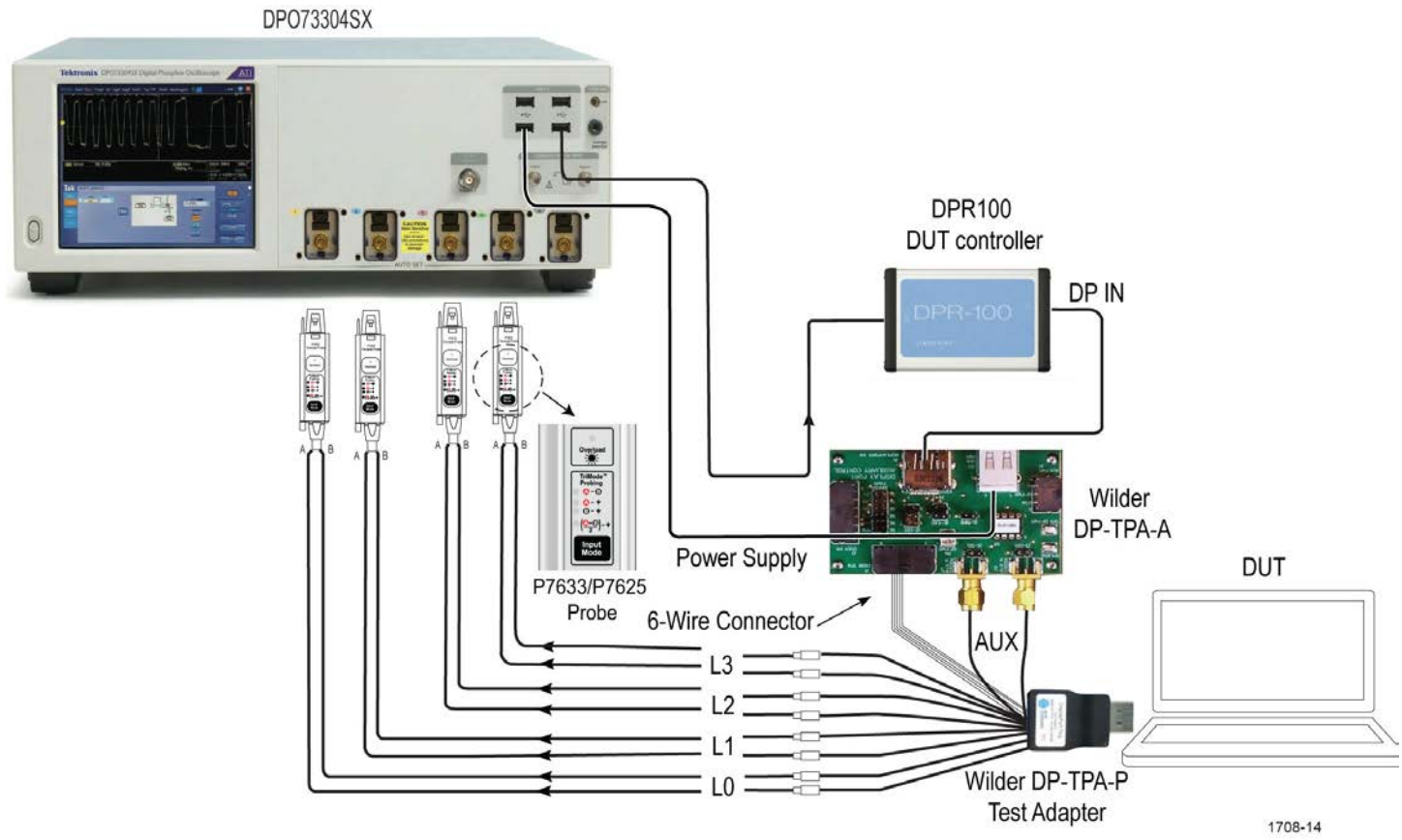
Application run using DPR-100

Equipment Connection Setup

Following are the connection setup diagrams for testing Type-C and Standard connectors using DPR-100.



Connection diagram for testing Type-C Connector

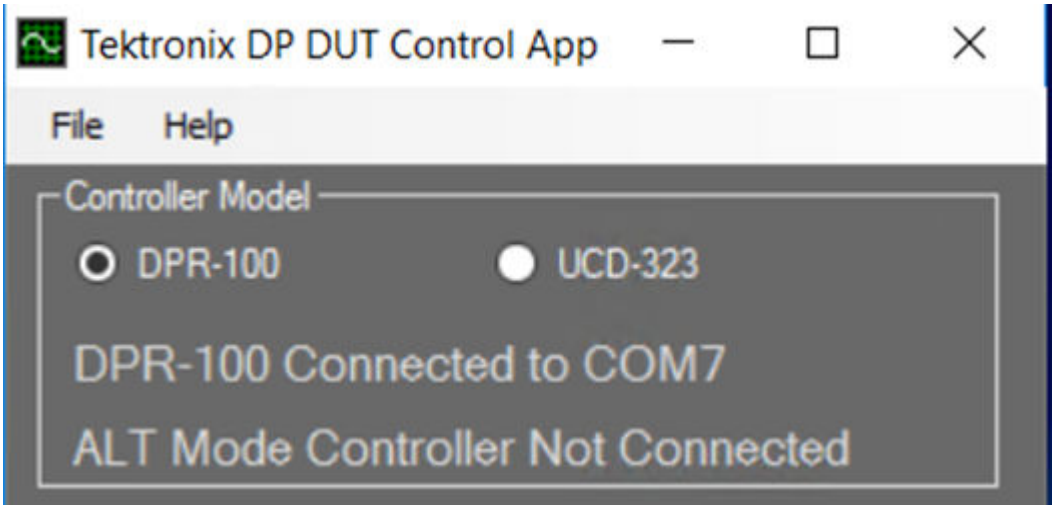


Connection diagram for testing Standard Connector

Device Connection

1. The **Controller Mode** radio button is selected DPR-100 by default. (If not ,Click the **DPR-100** radio button to start using DPR-100 controller).
2. If DPR100 controller and GRL-USB-PD is connected, then the application displays the following information on top of the window:
   - DPR-100 Connected to COM
   - ALT Mode Controller Connected

If GRL-USB-PD ALT Mode Controller is disconnected, then the application displays the below information:



NOTE: If you connect any devices after the application is launched, you have to re-start the **Tektronix DP DUT Control App** in order to detect them.

Application features

The application displays the following tabs:

1. **Phy Test:** Allows you to change the DisplayPort test pattern.
2. **Alt Mode:** Allows you to set the DUT in ALT Mode.
3. **Debug:** Allows you to read and write in the specified DPCD registers.
4. **AUX:** Allows you to change the AUX amplitude for AUX sensitivity measurement.

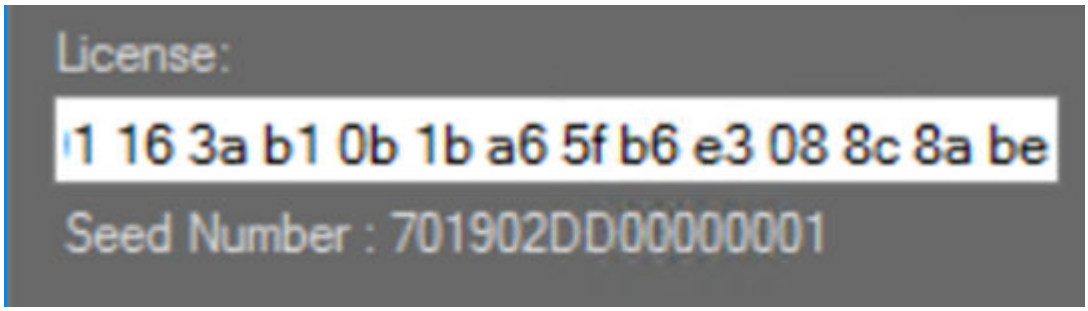
DPR-100 license

The DPR-100 controller needs a license to control the DUT.

The DPR-100 is a 40-bit license, provided by Unigraf. This license varies with the DPR-100 seed number. You need to use the correct license in order for the application to work properly.

Use one of the following two methods to specify the license:

- Enter the license in the **License** field.



- Update the license.txt file.
  - Open the folder where the application is installed.
  - Open license.txt.
- Enter the new license value in the text file.
  The license is of the format a0 a9 c1 xx xx fc 01 16 3a b1 0b 1b a6 5f b6 e3 08 8c 8a xx.

Phy Test tab

This tab allows you to change the DisplayPort test pattern.

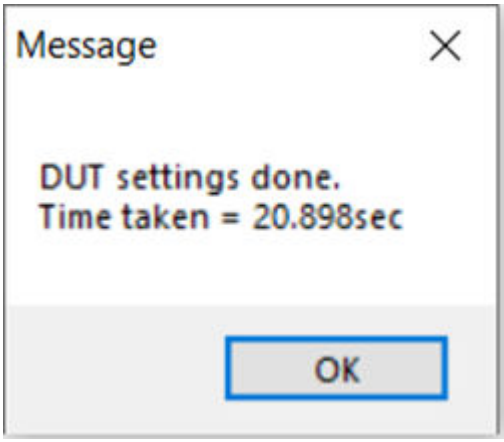
Supported Configurations are:

Field Name	Configuration
Data Rate	▪ 1.6 Gbps (RBR) ▪ 2.7 Gbps (HBR) ▪ 5.4 Gbps (HBR2) ▪ 8.1 Gbps (HBR3)

Field Name	Configuration
DP Version	▪ DP Rev 1.1 ▪ DP Rev 1.2 ▪ DP Rev 1.4
Data Pattern	▪ D10p2 (D10.2) ▪ PRBS7 ▪ PCTPAT ▪ PLTPAT ▪ COMP-EYE
Voltage	▪ 400 mV ▪ 600 mV ▪ 800 mV ▪ 1200 mV
Pre-emphasis	▪ 0 dB ▪ 3.5 dB ▪ 6.0 dB ▪ 9.5 dB
SSC	▪ Enabled ▪ Disabled
Is TypeC?	Select, if you are testing for Type-C connector. **NOTE:** GRL-USB-PD controller is required to test the TypeC connector.
Script File Path	Specify the script file that needs to be executed for changing the patterns. Refer toHow to change the DP DUT control scripts?

Click **Apply** to execute the specified script.

When is script is completed, it displays the following dialog box.

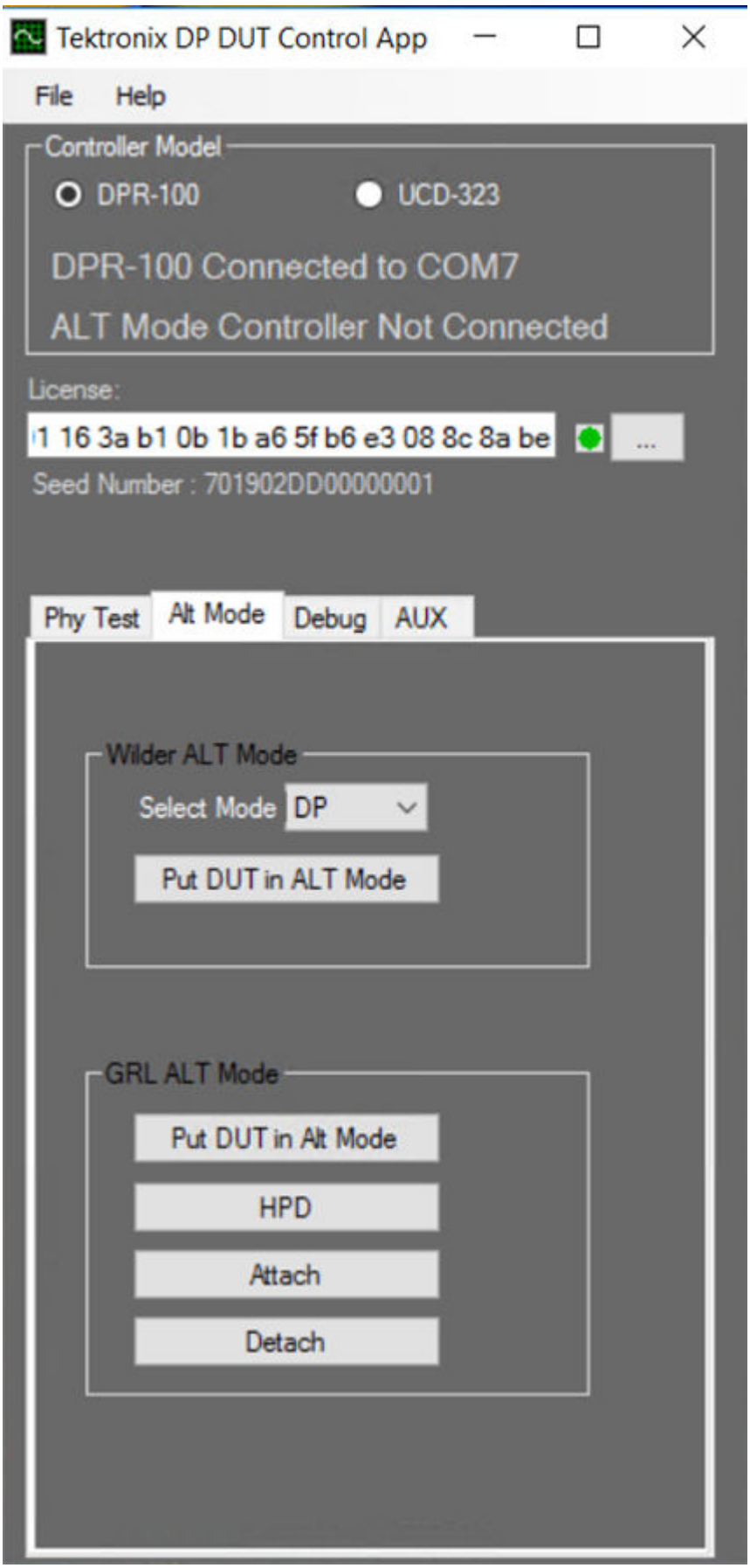


NOTE: The DUT will accept the voltage swing and pre-emphasis combination as per the constraint in the table below.

Voltage Swing level	Pre-emphasis test			
	Level 0	Level 1	Level 2	Level 3
	Vdiff_pre_pp	Vdiff_pre_pp	Vdiff_pre_pp	Vdiff_pre_pp
0	Required	Required	Required	Optional
1	Required	Required	Required	Not Allowed
2	Required	Required	Not Allowed	Not Allowed
3	Optional	Not Allowed	Not Allowed	Not Allowed

Alt Mode tab

This tab allows you to set the DUT in DisplayPort Alt mode.

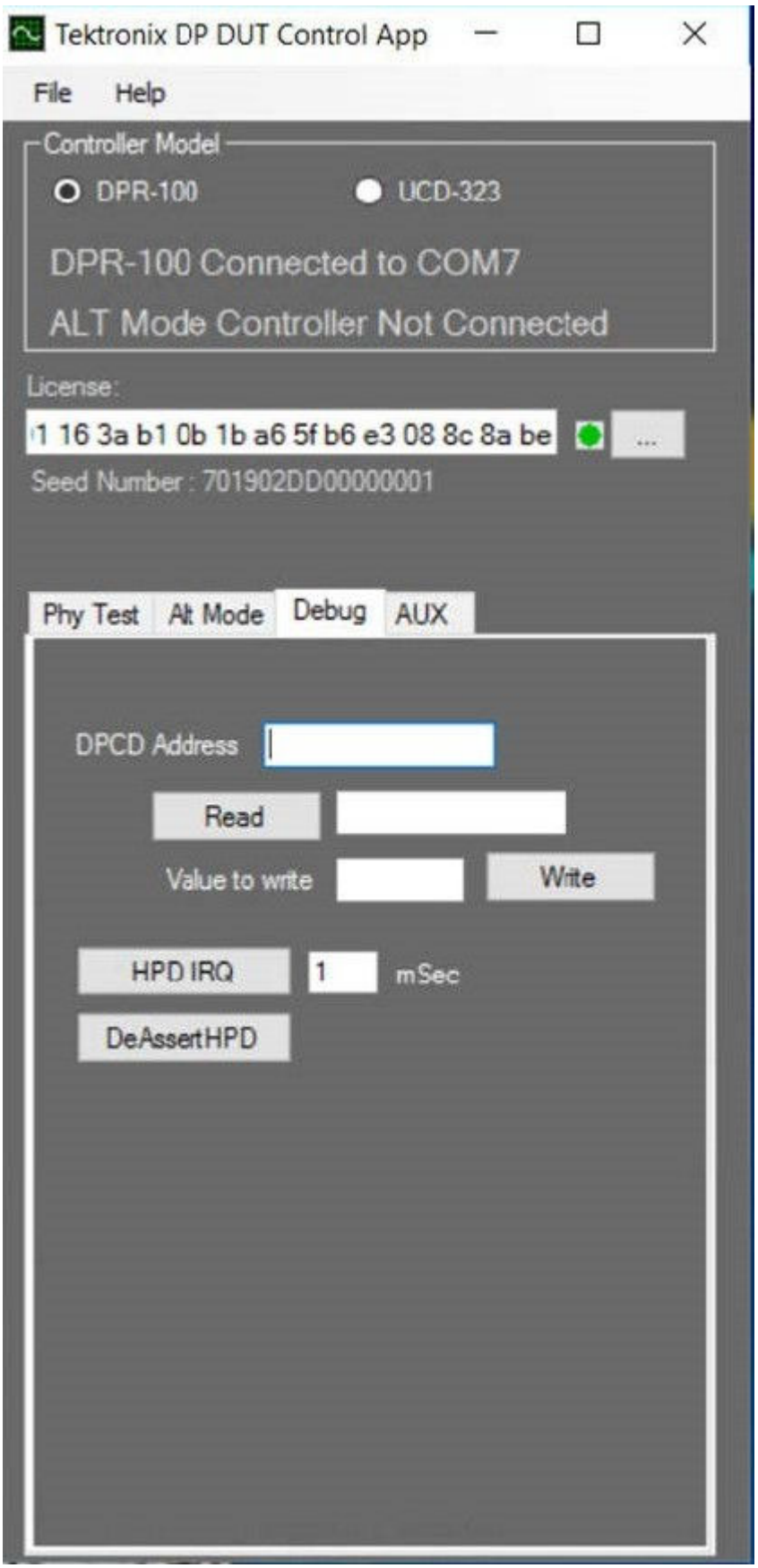

Tektronix DP DUT Control App
File
Help
Controller Model
DPR-100
UCD-323
DPR-100 Connected to COM7
ALT Mode Controller Not Connected
License:
1 16 3a b1 0b 1b a6 5f b6 e3 08 8c 8a be
...
Seed Number : 701902DD00000001
Phy Test
Alt Mode
Debug
AUX
Wilder ALT Mode
Select Mode
DP
Put DUT in ALT Mode
GRL ALT Mode
Put DUT in Alt Mode
HPD
Attach
Detach

Complete the following steps to set the DUT:

1. **Put DUT in Alt Mode:** When clicked the application will configure the sink, enable the VDM, and set the DUT into DP alt mode.
2. **HPD:** Click to simulate the HPD.
3. **Attach:** Click to attach to the DUT.
4. **Detach:** Click to simulate the detach.

Debug tab

This tab allows you to read and write the DPCD registers. For Standard connector **HPD IRQ**, **DeAssert HPD** is issued.



Complete the following steps to debug:

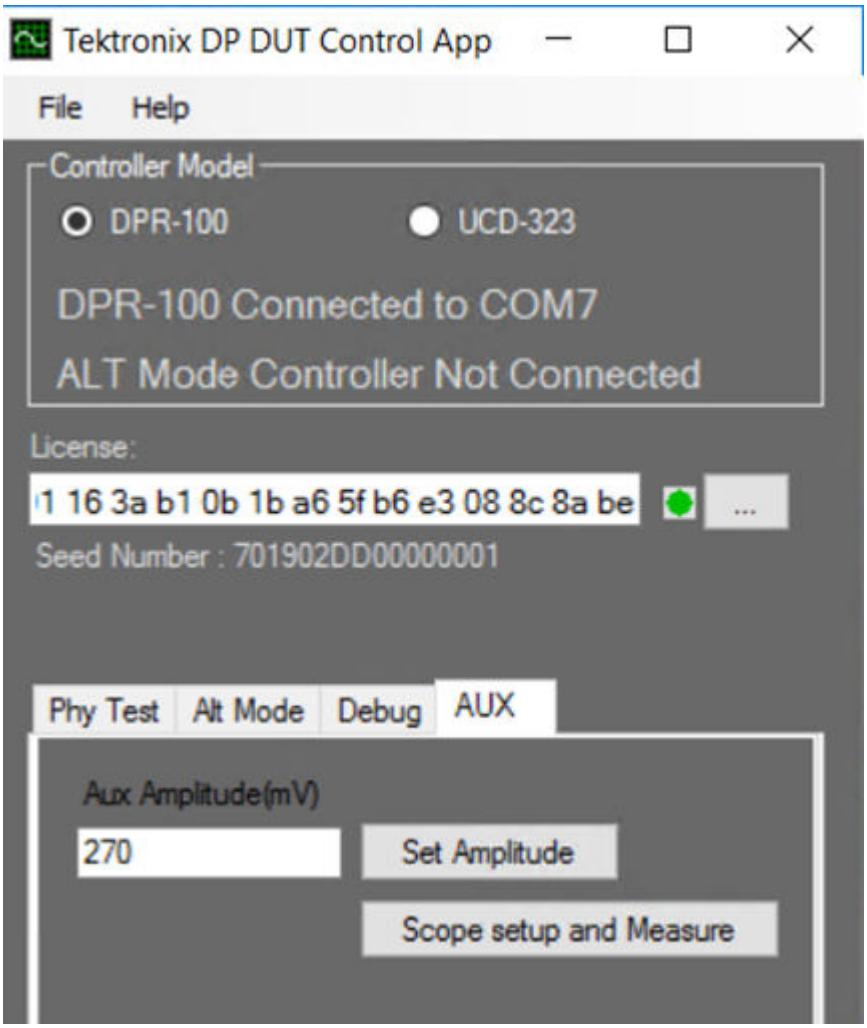
1. **DPCD Address:** Enter the DPCD address.
2. **Read:** Displays the PCD register value from the specified DPCD Address.
3. **Value to write:** Enter the value to write the DPCD address.

NOTE: The value should be in HEX.

4. **HPD IRQ:** Allows you to assert the HPD IRQ to the specified millisecond.
5. **DeAssertHPD:** Click to issue the DeAssertHPD signal.

AUX tab

This tab allows you to change the AUX amplitude for the AUX sensitivity measurement.



Complete the steps to configure the AUX:

1. **AUX Amplitude (mV):** Specify the required amplitude, in millivolts.
2. **Set Amplitude:** Click to set the amplitude on DPR-100.
3. **Scope setup and Measure:** Click to set all the oscilloscope settings (Vertical and Horizontal settings), initiate the Aux transactions, and capture the signal on the oscilloscope. When the transaction is complete, the application measures the amplitude of the signal and reports it.

How to change the DUT DP control scripts for DPR-100

The Application uses the scripts for controlling the DUT to transmit different test pattern.

```
// Script for controlling the DUT. This is a comment DeAssertHPD //Specify the delay.
Delay is in mSec. Delay 1000 //Perform the link training. //Set TEST_LINK_RATE,
TEST_LANE_COUNT. Specify FINAL_VOLTAGE_SWING, //FINAL_PREEMPHASIS, FINAL_POST_CURSOR2
LinkTrainingExt Delay 1000 // Assert HPD signal AssertHPDDelay 1000 //Send HPD IRQ signal
HPDIRQ //Change the pattern, voltage, pre-emphais values//It changes the
PHY_TEST_PATTERN, ADJREQ_VOLTAGE_SWING, ADJREQ_PREEMPHASIS PhyTest Delay 1000 HPDIRQ
```

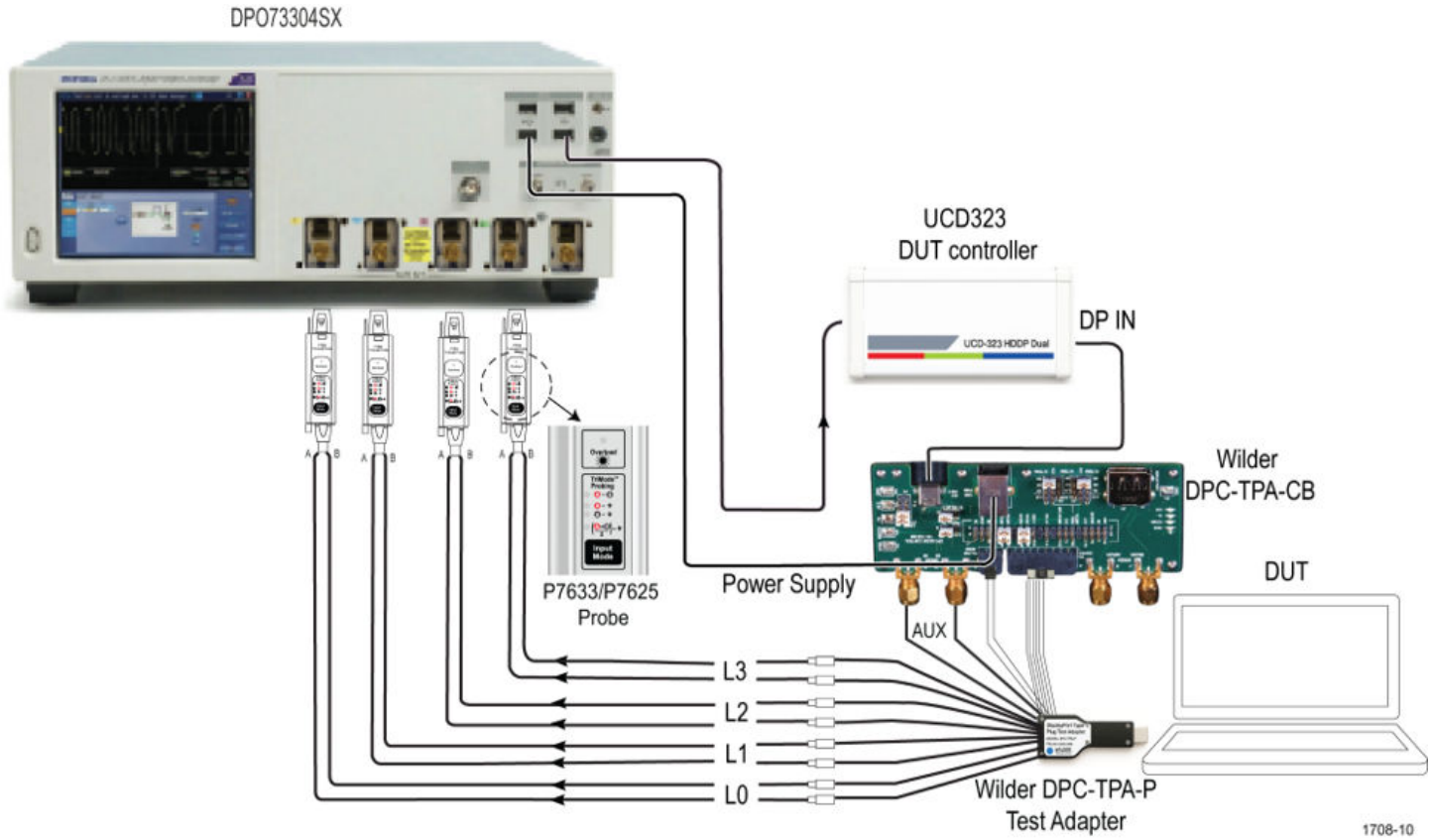
The commands can be modified as per the requirement. The available commands are:

Command	Description
AssertHPD	Sends Assert HPD signal
DeAssertHPD	Sends DeAssert HPD signal
HPDIRQ	Sends HPD IRQ signal
Delay	Causes the specified amount of delay. Below command shows 1Sec delay `Delay <timeInMilliSec> ,` e.g: Delay 1000
DPCDReg	Sets the specified DPCD register by the value specified `DPCDReg <Address in Hex, Value in Hex>,` e.g DPCDReg 248,0
ConfigurePattern	Sets the required DPCD register to change the pattern.
ConfigureSSC	Sets the required DPCD register to change the SSC.
ConfigureDataRate	Sets the required DPCD register to change the data rate.
ConfigureAmplituePreEmphasis	Sets the required DPCD register to change the amplitude and pre-emphasis values.
ClearAllBits	Clears the bits which are set for controlling the DUT.
LinkTraining	Perform the initial link training.
LinkTrainingExt	Perform the 2nd link training.
PhyTest	Change the pattern.
PctsPhyTestPattern	Perform the initial link training (Performs the Link negotiation)
PctsLinkTraining	Perform the 2nd link training (Performs the Link negotiation)a

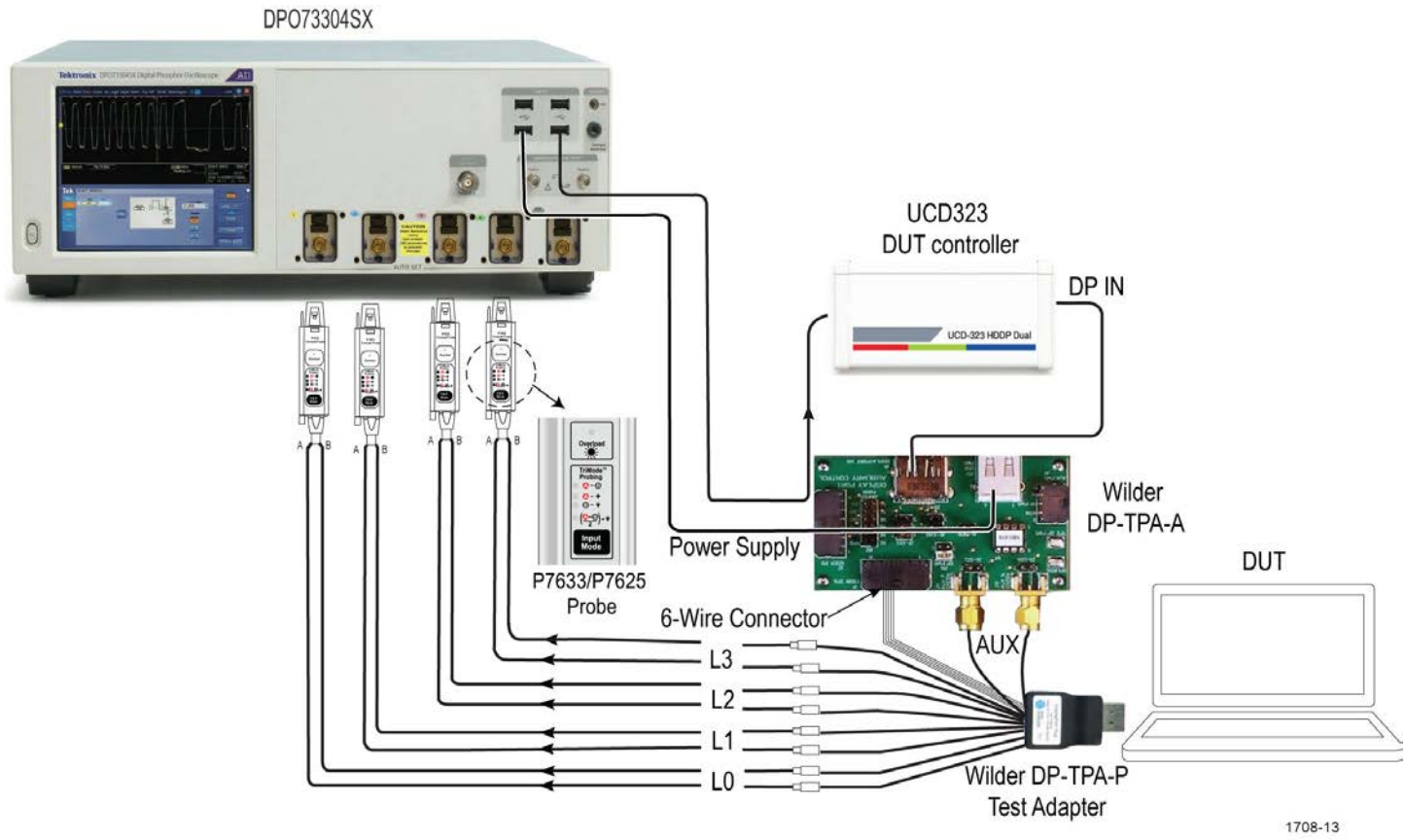
Application run using UCD-323

Equipment Connection Setup

Following are the connection setup diagrams for testing Type-C and Standard connectors using UCD-323



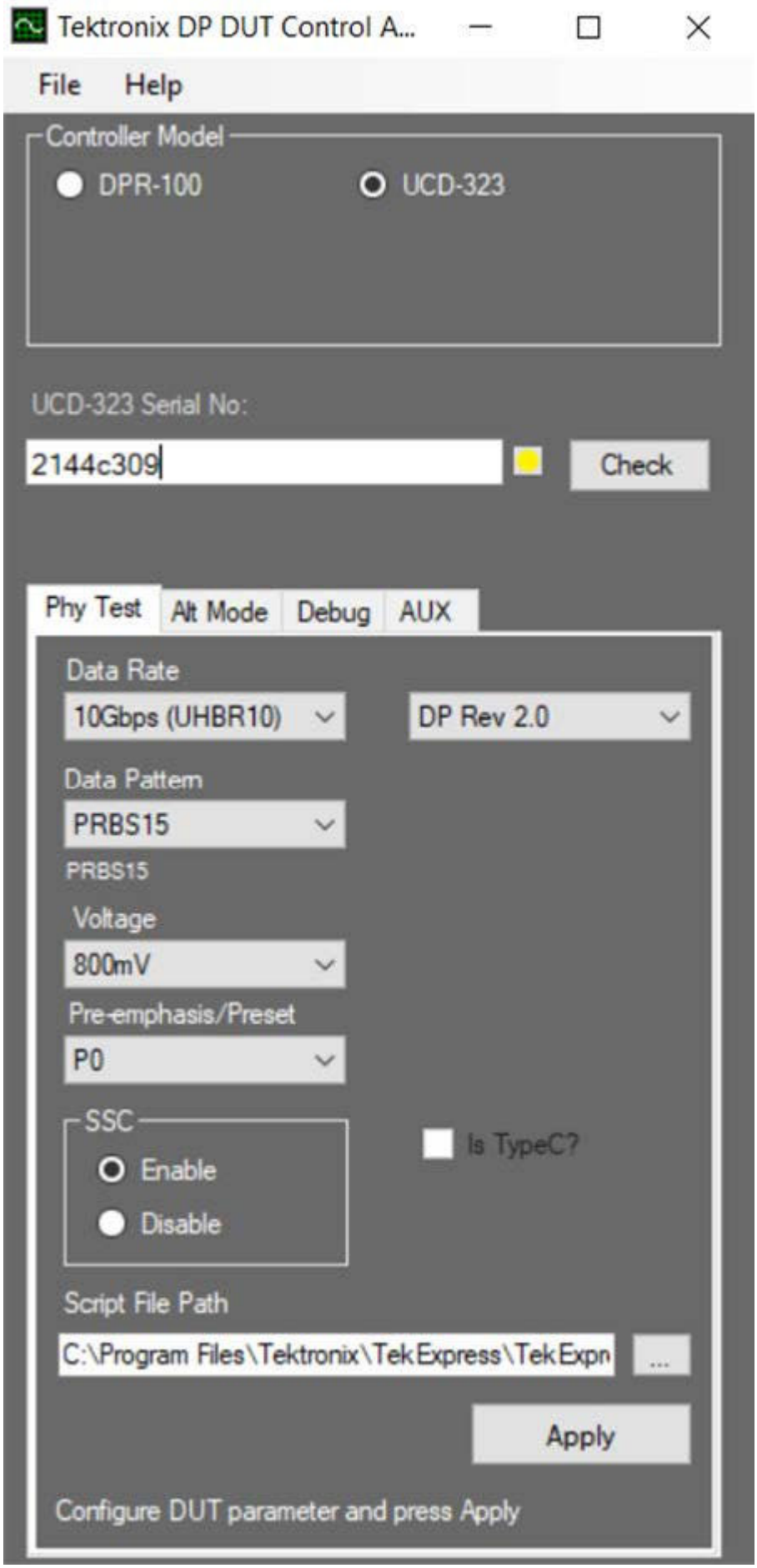
Connection diagram for testing Type-C Connector



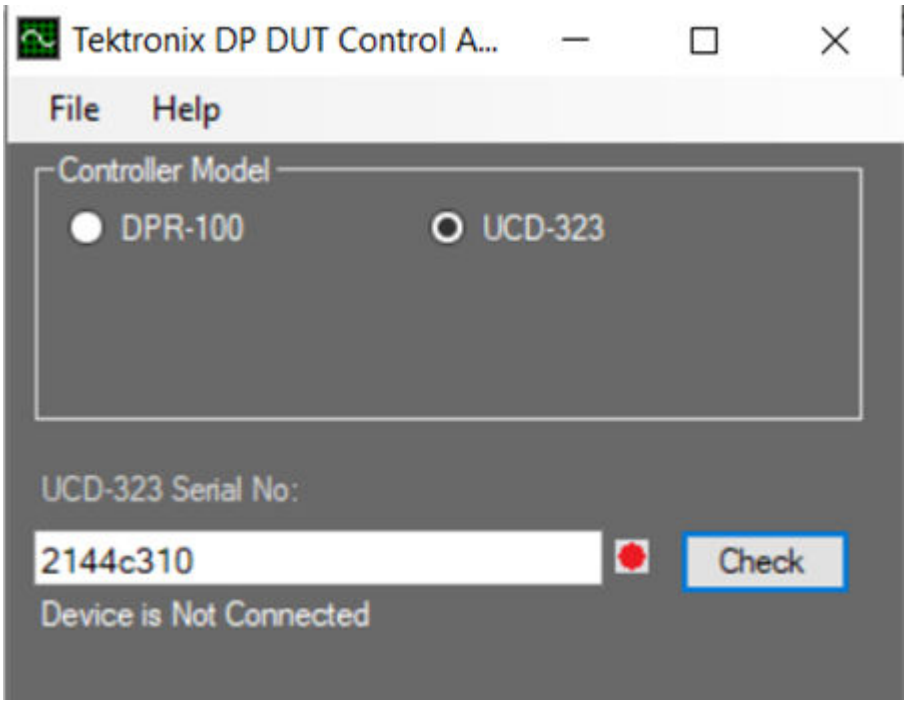
Connection diagram for testing Standard Connector

Device Connection

1. Click the **UCD-323** radio button in Controller Model Section to start using UCD-323 controller.

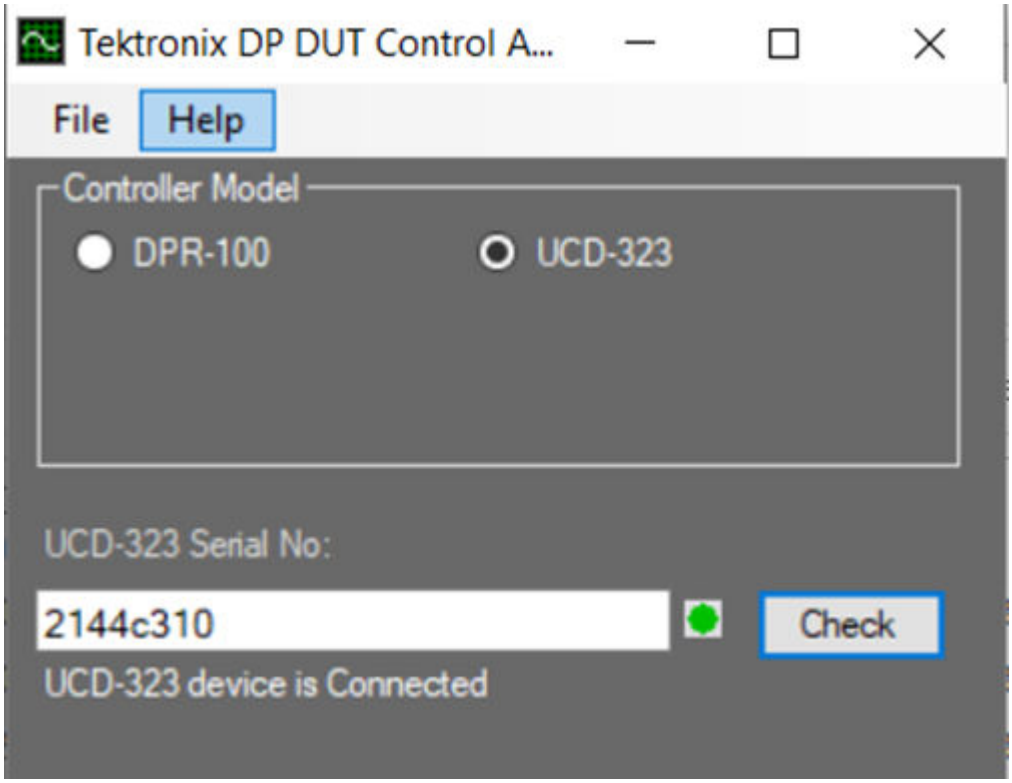

Tektronix DP DUT Control A...
File
Help
Controller Model
DPR-100
UCD-323
UCD-323 Serial No:
2144c309
Check
Phy Test
Alt Mode
Debug
AUX
Data Rate
10Gbps (UHBR10)
DP Rev 2.0
Data Pattern
PRBS15
PRBS15
Voltage
800mV
Pre-emphasis/Preset
P0
SSC
Enable
Disable
Is TypeC?
Script File Path
C:\Program Files\Tektronix\TekExpress\TekExpr
...
Apply
Configure DUT parameter and press Apply

2. Enter the Serial Number of the UCD-323 device and click "**Check**" button to check whether it is connected.
   If **UCD-323 Controller** is disconnected then the application displays the below information:



UCD-323 device is Disconnected

If **UCD-323** is connected, then the application displays the following information on top of the window:



UCD-323 device is connected

NOTE: If you connect any devices after the application is launched, you have to re-start the **Tektronix DP DUT Control App** in order to detect them

Application features

The application displays the following tabs:

1. **Phy Test**: Allows you to control the DUT.

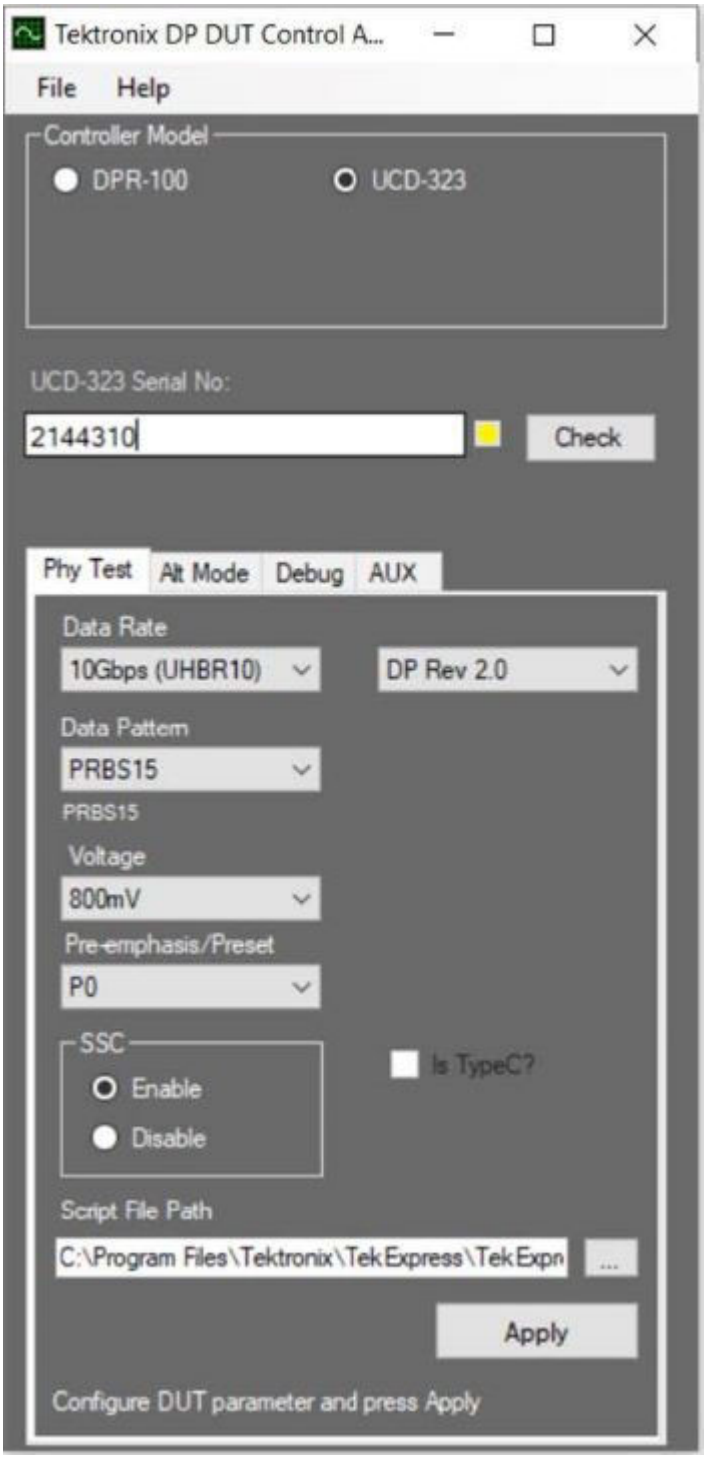
UCD-323 Serial Number

The UCD-323 controller needs a serial number to control the DUT.

The UCD-323 Serial is an Alpha-Numeric string, provided by Unigraf which varies with each UCD-323 controller. You need to use the correct serial number in order for the application to work.

Phy Test tab

This tab allows you to control the DUT.

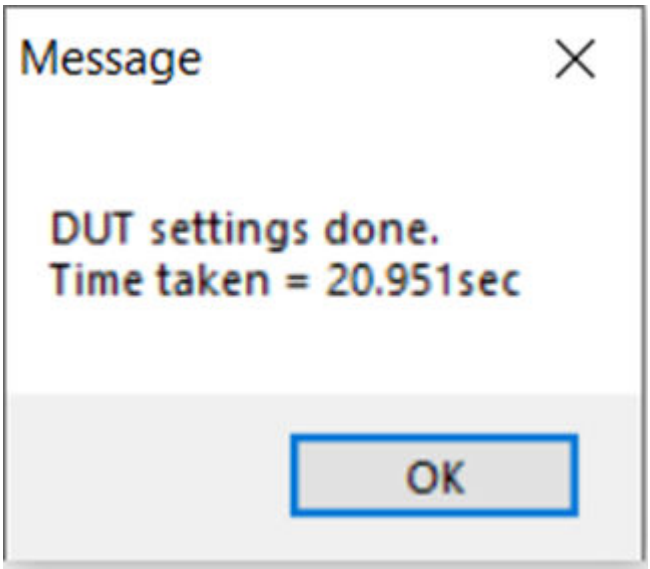


Supported configurations are:

Field Name	Configuration
Data Rate	▪ 1.6 Gbps (RBR) ▪ 2.7 Gbps (HBR) ▪ 5.4 Gbps (HBR2) ▪ 8.1 Gbps (HBR3) ▪ 10 Gbps (UHBR10) ▪ 13.5 Gbps (UHBR13.5) ▪ 20 Gbps (HBR20
DP Version	▪ DP Rev 1.1 ▪ DP Rev 1.2 ▪ DP Rev 1.4 ▪ DP Rev 2.1
Data Pattern	▪ D10p2 (D10.2) ▪ PRBS7 ▪ PCTPAT ▪ PLTPAT ▪ COMP-EYE ▪ PRBS15 ▪ PRBS31 ▪ SQ128 ▪ SQ128_CP13 ▪ SQ128_CP14 ▪ SQ128_CP15 ▪ SQ128_CP16
Voltage	▪ 400 mV ▪ 600 mV ▪ 800 mV ▪ 1200 mV
Pre-emphasis	▪ 0 dB ▪ 3.5 dB ▪ 6.0 dB ▪ 9.5 dB

Field Name	Configuration
Preset	▪ P0 ▪ P1 ▪ P2 ▪ P3 ▪ P4 ▪ P5 ▪ P6 ▪ P7 ▪ P8 ▪ P9 ▪ P10 ▪ P11 ▪ P12 ▪ P13 ▪ P14 ▪ P15
SSC	▪ Enabled ▪ Disabled
Is TypeC?	Select, if you are testing for Type-C connector.
Script File Path	Specify the script file that needs to be executed for changing the patterns. Refer to How to change the DP DUT control scripts?

Click **Apply** to execute the specified script. When is script is completed, it displays the following dialog box.



How to change the DUT DP control scripts with UCD-323

The Application uses the scripts for controlling the DUT to transmit different test pattern.

```
// Script for controlling the DUT. This is a comment //Perform the link training. //Set
TEST_LINK_RATE, TEST_LANE_COUNT. Specify FINAL_VOLTAGE_SWING, //FINAL_PREEMPHASIS,
FINAL_POST_CURSOR2//LinkTraining//Delay 1000//Change the pattern, voltage, pre-emphais
values//It changes the PHY_TEST_PATTERN, ADJREQ_VOLTAGE_SWING, ADJREQ_PREEMPHASIS PhyTest
Delay 1000
```

The commands can be modified as per the requirement. The available commands are:

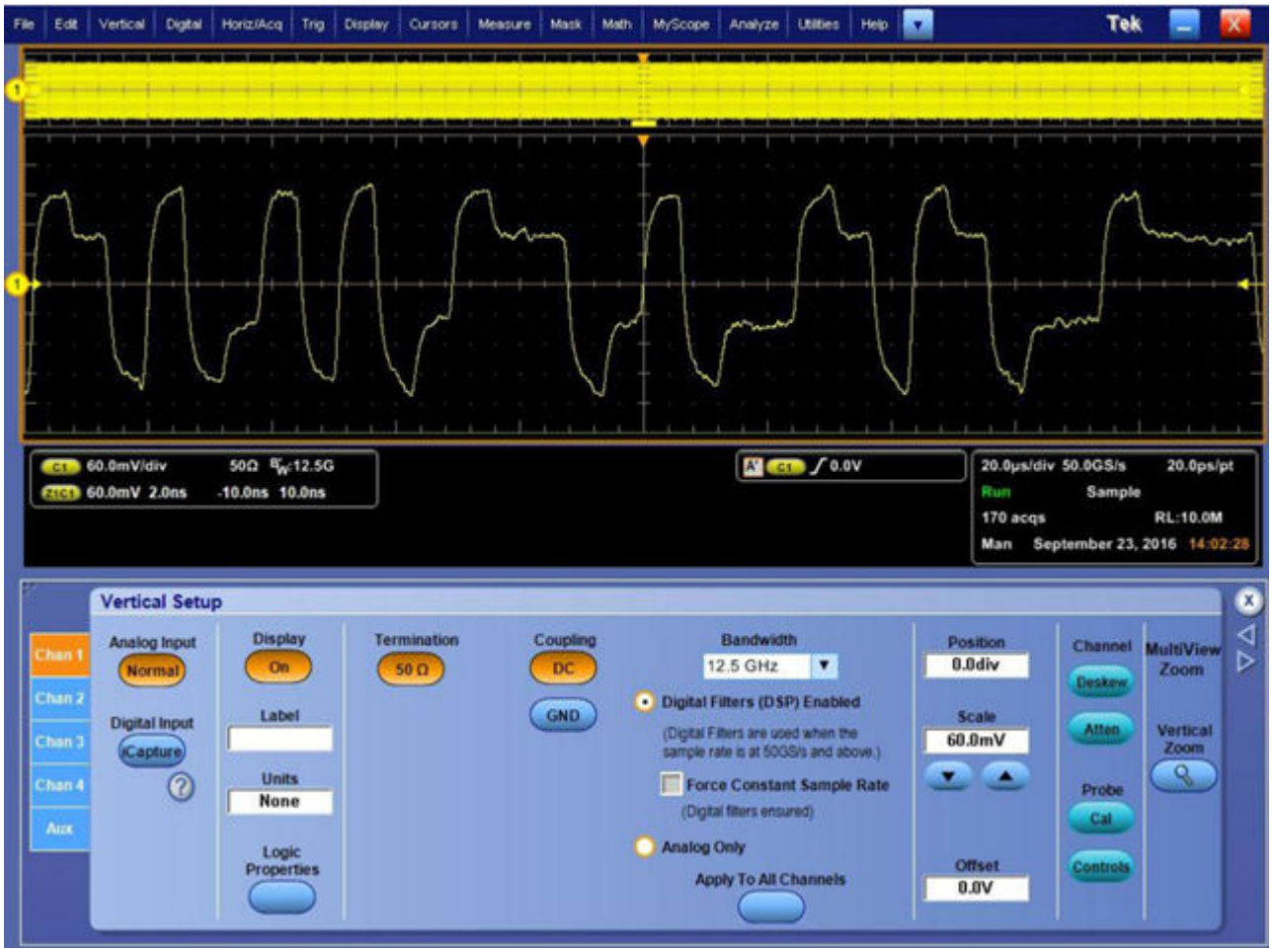
Command	Description
Delay	Causes the specified amount of delay. Below command shows 1Sec delay `Delay <timeInMilliSec>,` e.g: Delay 1000
DPCDReg	Sets the specified DPCD register by the value specified `DPCDReg <Address in Hex>,<Value in Hex>,` e.g DPCDReg 248,0
LinkTraining	Perform the initial link training.
LinkTrainingExt	Perform the 2nd link training.
PhyTest	Change the pattern.
PhyTestExt	Perform the 2nd PhyTest.

Verify Data Rate, Pattern, and SSC

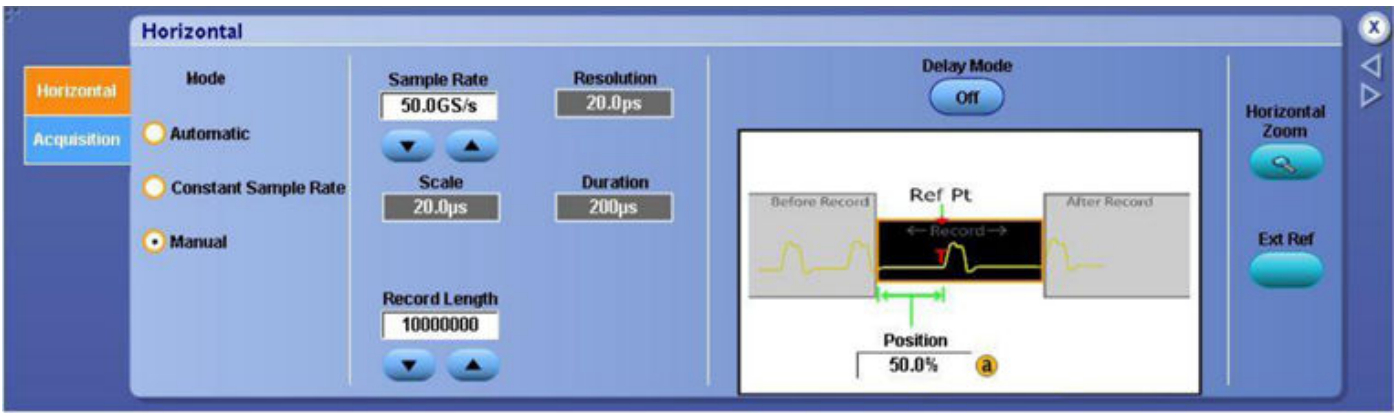
Complete the following steps to verify the Data Rate, Pattern, and SSC parameters.

NOTE: DPOJET (Tektronix Jitter, Noise and Eye Diagram Analysis software) is required to verify the parameters.

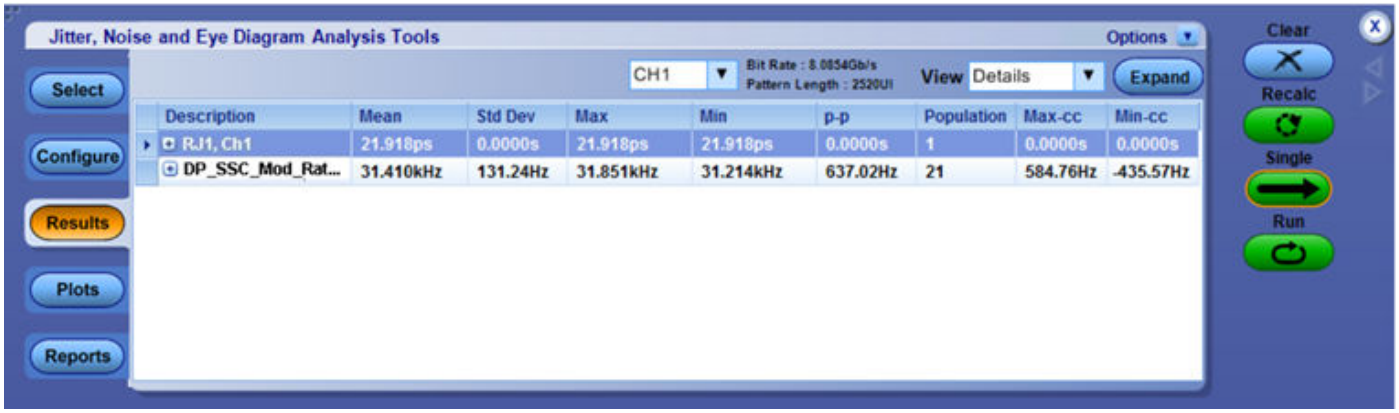
1. **Vertical Setting :Select Vertical > Vertical Setup**. Adjust the scale so that the waveform occupies the eight division of the oscilloscope.



2. **Horizontal Setting : Select Horiz/Acq > Horizontal/Acquisition Setup**. Select Sample Rate of 10 GS/s and Record Length of 10 M.



3. **DPOJET Settings**: Select **Analyze > Jitter and Eye Analysis** (DPOJET). Select the following measurements:
   1. **Jitter > RJ**
   2. **Standard > DisplayPort > DP_SSC_Mod_Rate**



NOTE: Ensure that the values of Bit Rate and Pattern Length are valid.

The following table lists the Pattern Length for the available patterns:

Pattern	Pattern Length
DP10.2	2
PRBS7	127
PLTPAT	2
PCTPAT	
TPS4	
COMP-EYE	2,520
PRBS15	32,767
PRBS31	2,41,59,19,105
SQ128	

Pattern	Pattern Length
SQ128_CP13	
SQ128_CP14	
SQ128_CP15	
SQ128_CP16	

If SSC is enabled, then SSC Mod Rate is 33 kHz.

SCPI Commands

About SCPI command

You can use the standard commands for Programmable Instruments (SCPI) to communicate remotely with the TekExpress application. Complete the TCPIP socket configuration and the TekVISA configuration in the oscilloscope or in the device where you are executing the script.

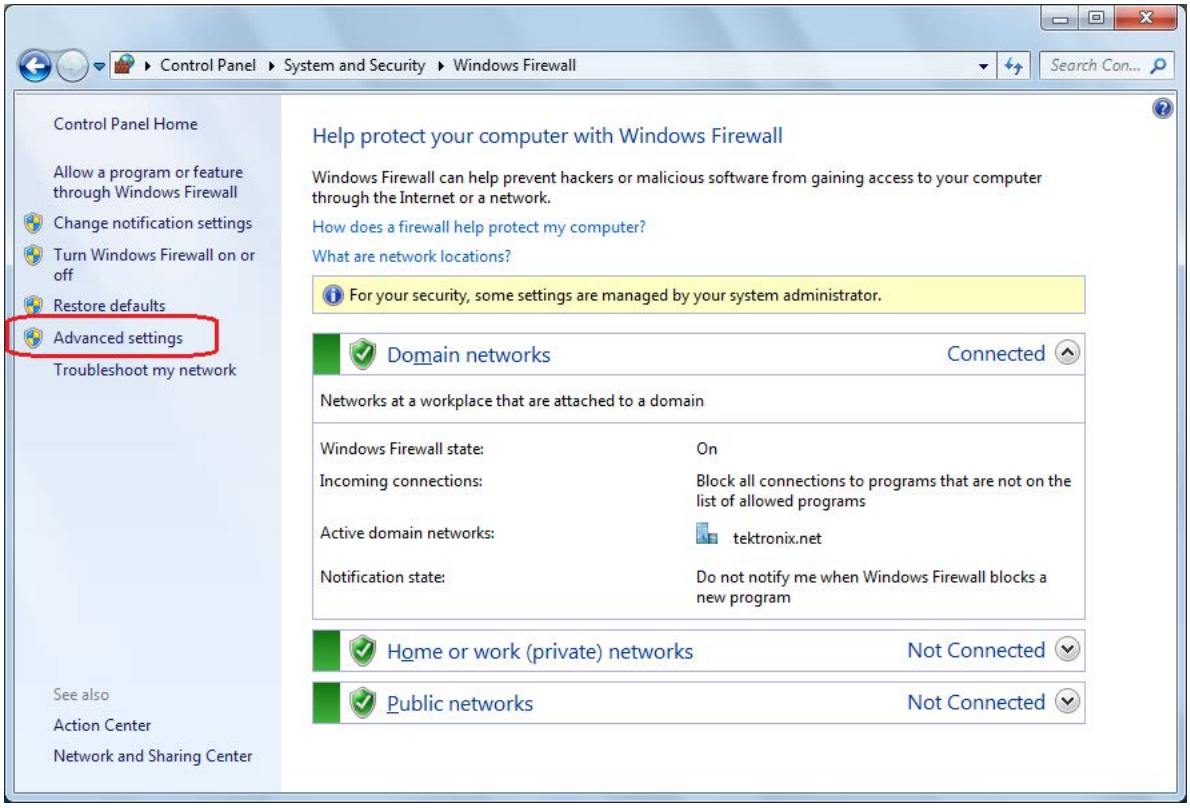
NOTE: If you are using an external PC to execute the remote interface commands, then install TekVISA in the PC to make the configurations.

Socket configuration for SCPI commands

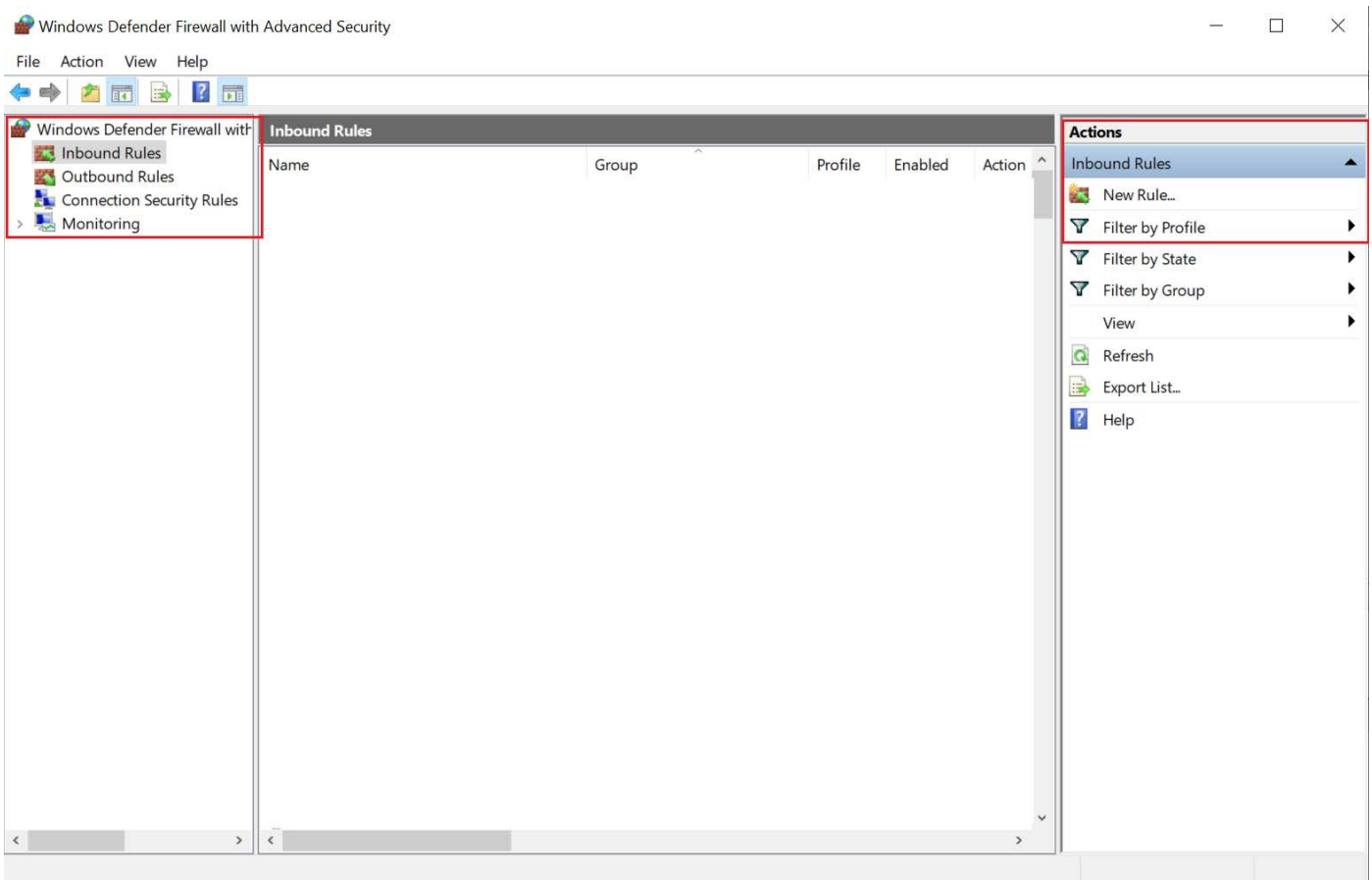
This section describes the steps to configure the TCPIP socket configuration in your script execution device and the steps to configure the TekVISA configuration in the oscilloscope to execute the SCPI commands.

TCPIP socket configuration

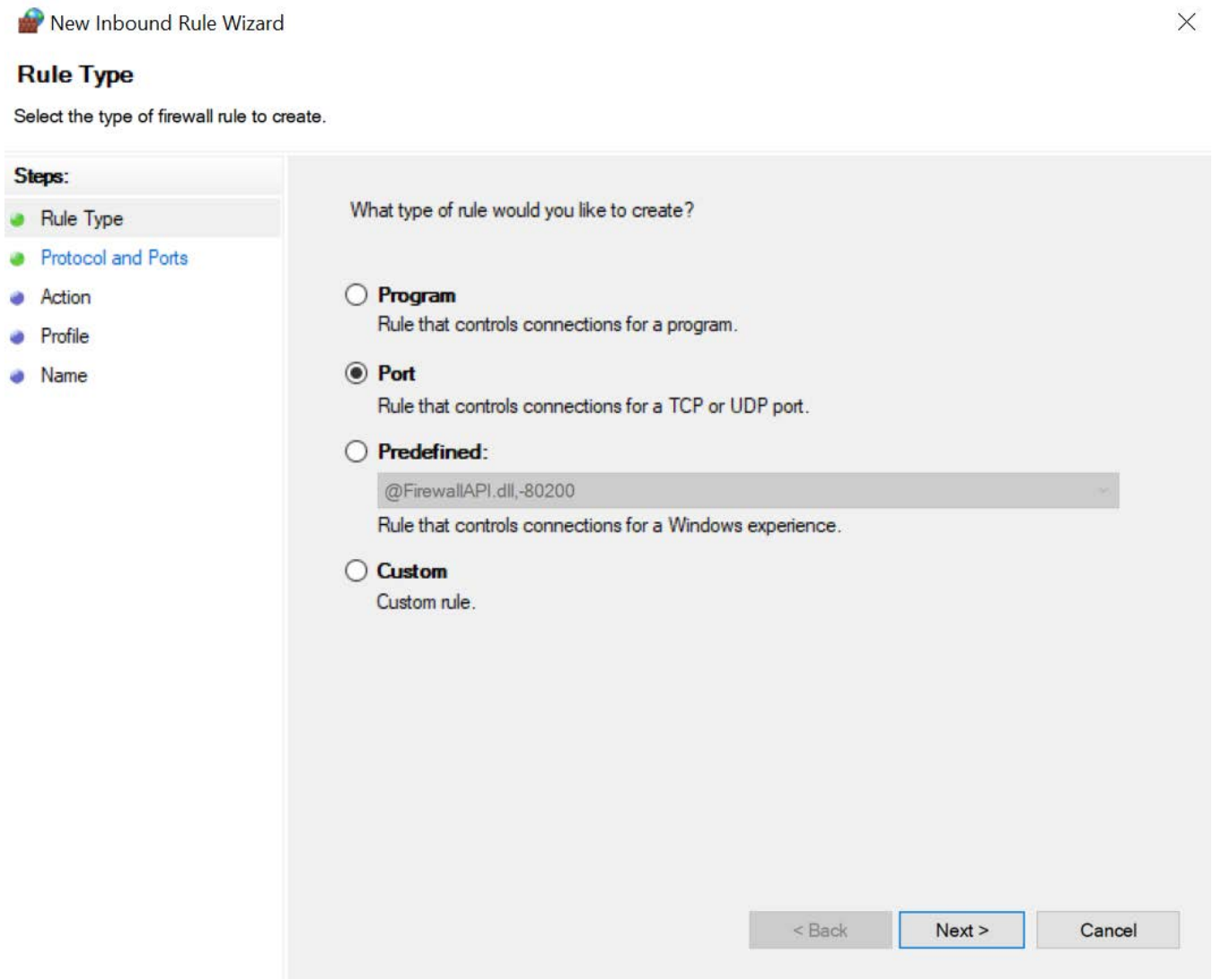
1. Click **Start**→ **Control Panel**→ **System and Security**→ **Windows Firewall**→ **Advanced settings**.



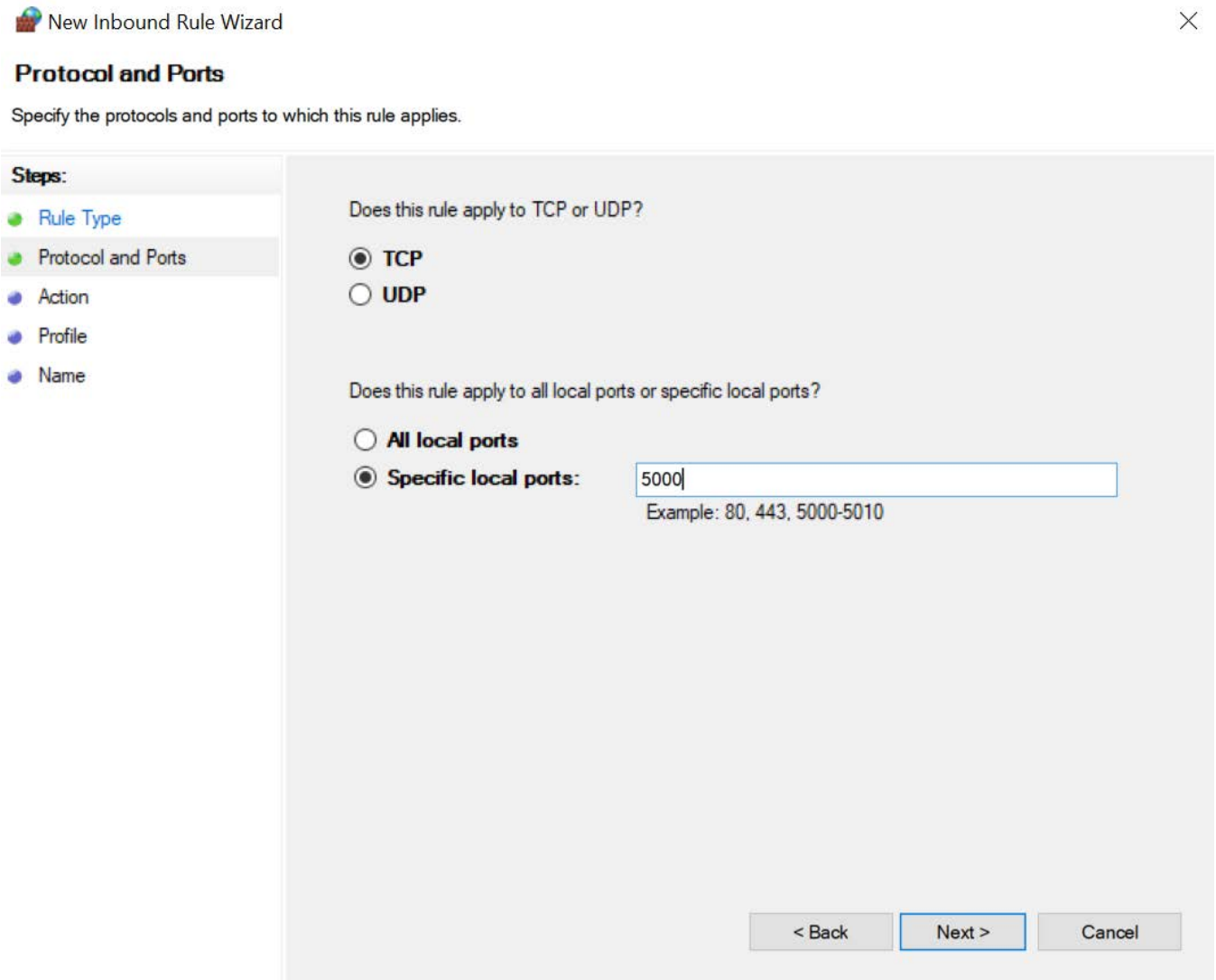
2. In Windows Firewall with Advanced Security menu, select **Windows Firewall with Advanced Security on Local Computer**→ **Inbound Rules** and click **New Rule…**



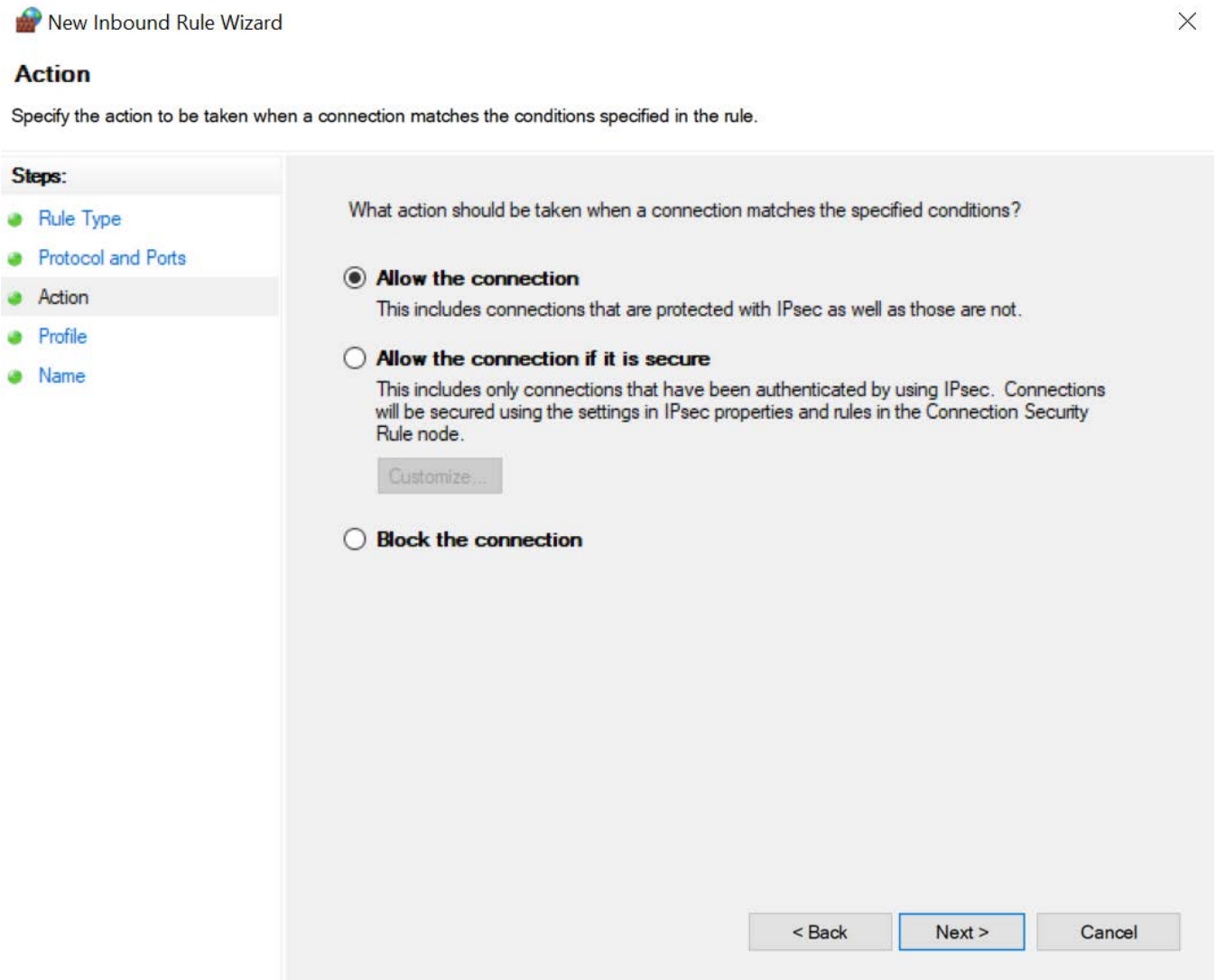
3. In **New Inbound Rule Wizard** menu
   a. Select **Port** and click **Next**.



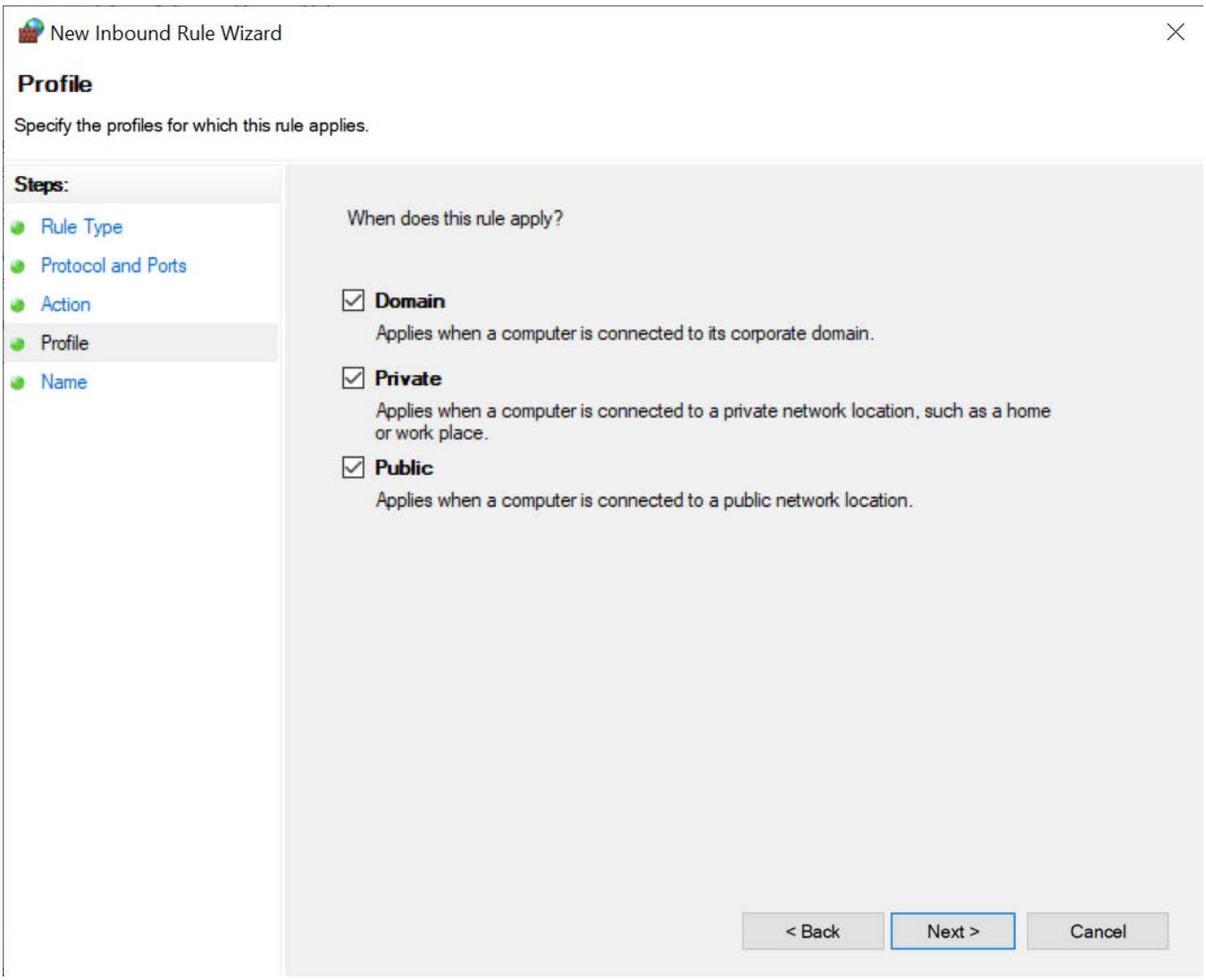
b. Select **TCP** as rule apply, enter 5000 for **Specific local ports** and click **Next**.



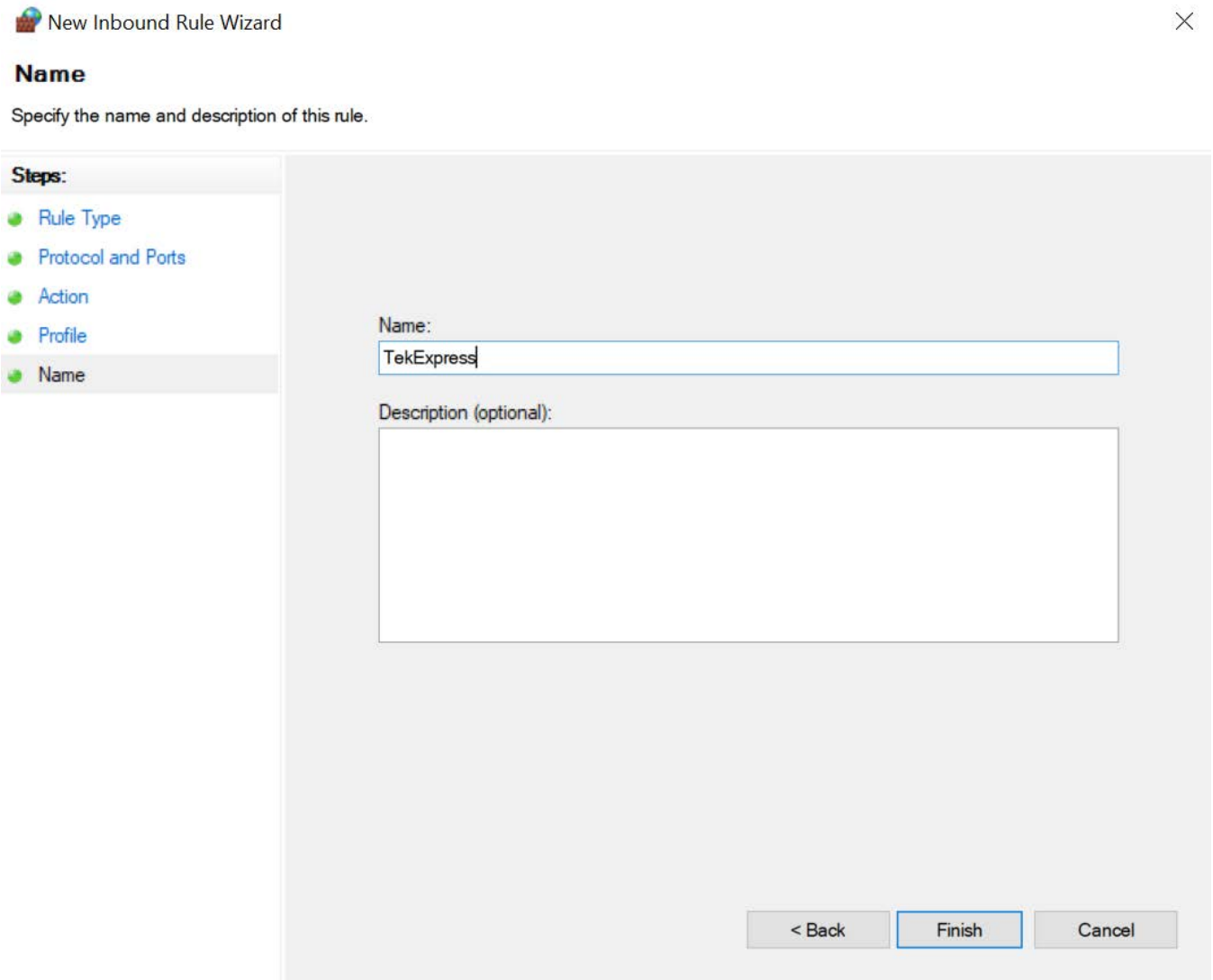
c. Select **Allow the connection** and click **Next**.



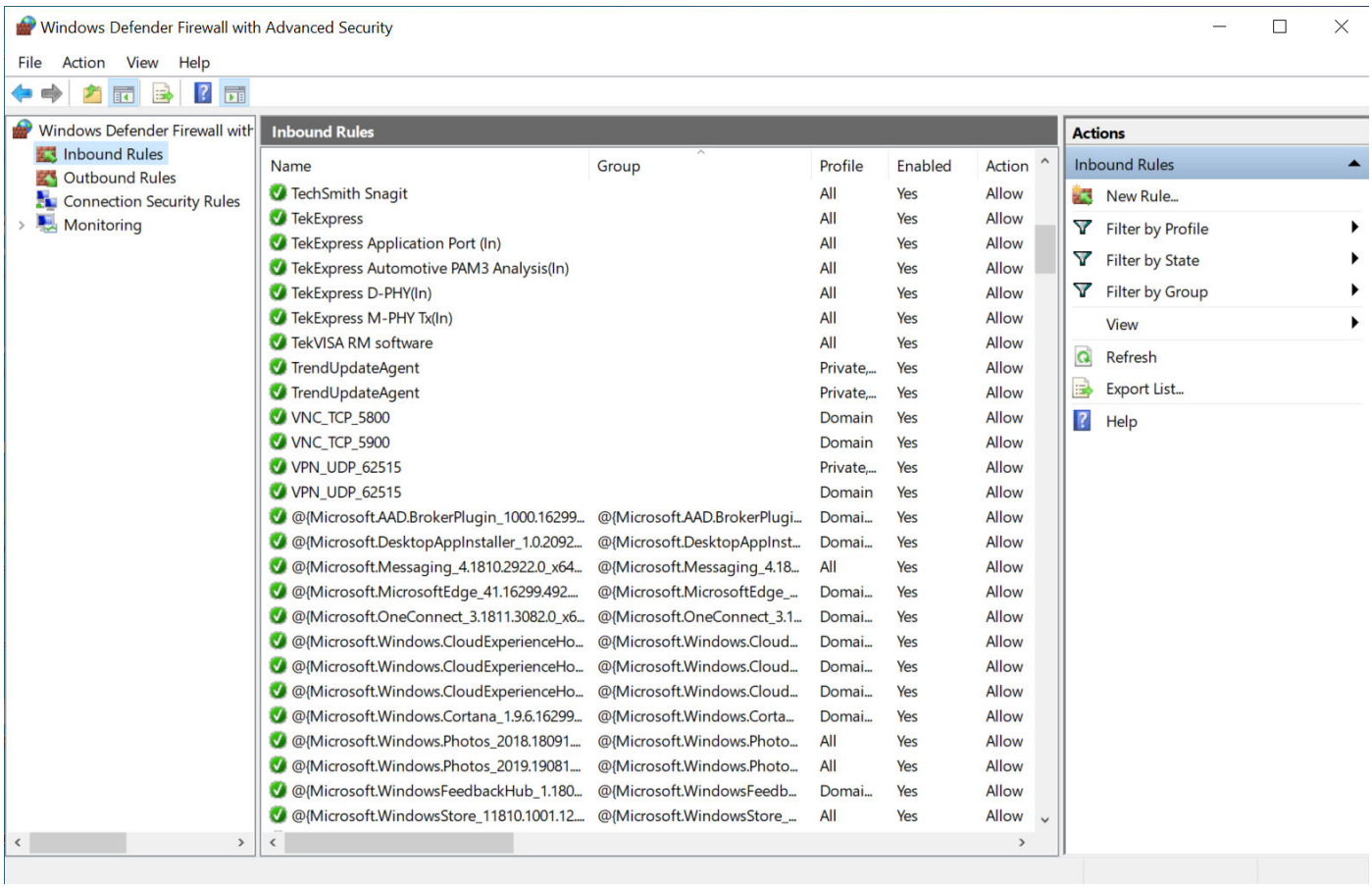
d. Select **Domain, Private, Public** checkbox and click **Next**.



e. Enter **Name**, Description (optional), and click **Finish**.

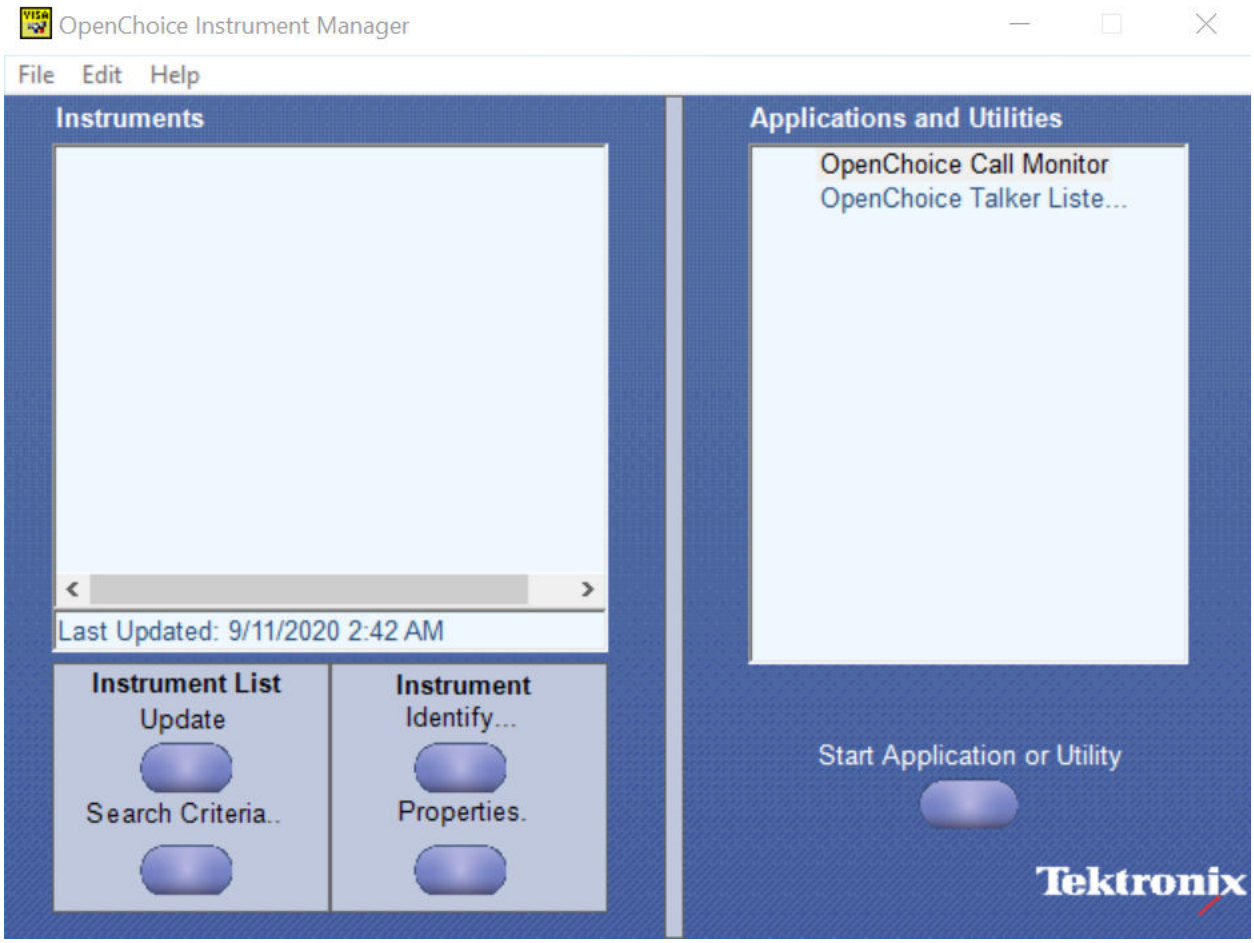


4. Check whether the Rule name is displayed in **Windows Firewall with Advanced Security menu→ Inbound Rules**.



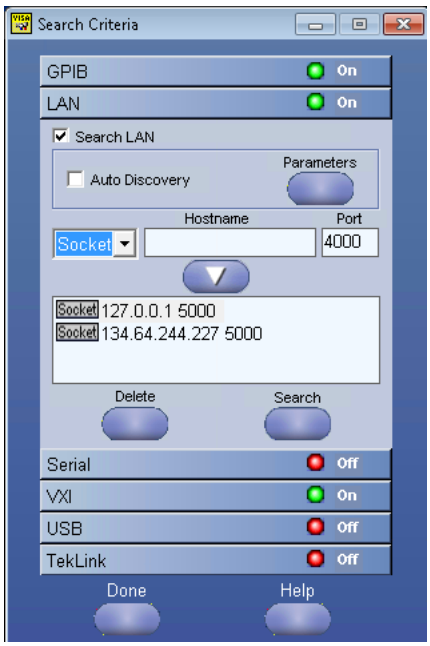
TekVISA configuration

1. Click **Start→ All Programs→ TekVISA→ OpenChoice Instrument Manager**.

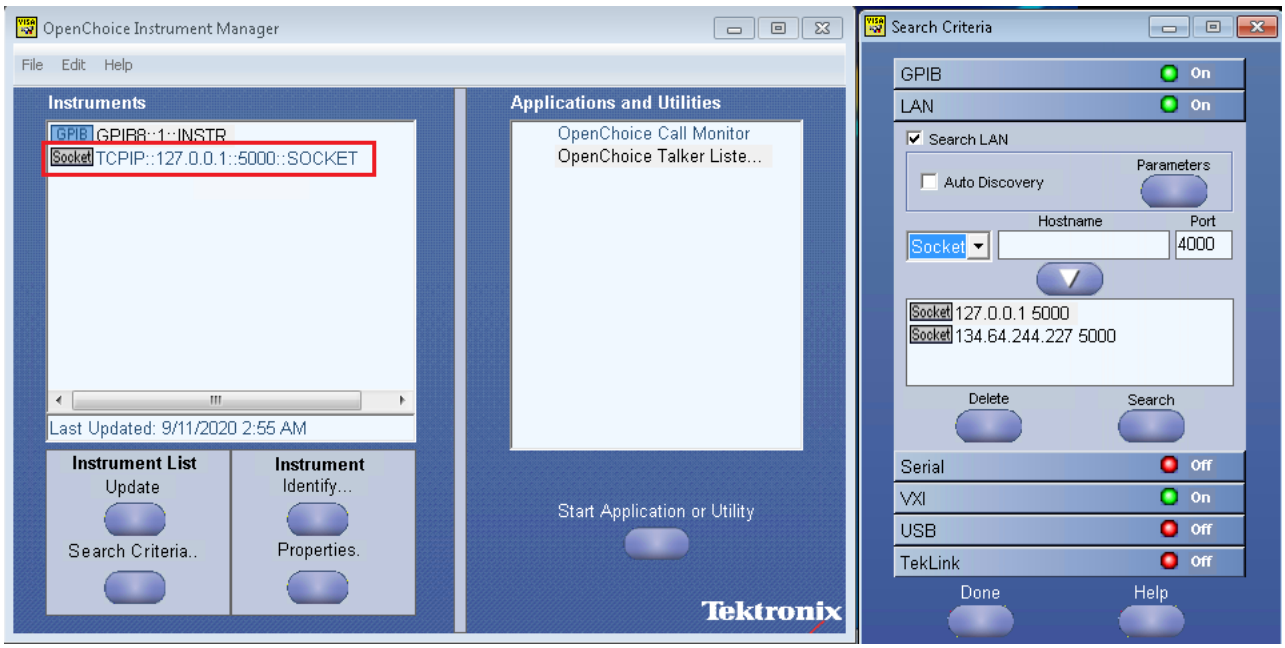


2. Click **Search Criteria**. In **Search Criteria** menu, click **LAN** to Turn-on. Select **Socket** from the drop-down list, enter the IP address of the TekExpress device in **Hostname** and type **Port** as 5000. Click to configure the IP address with Port.

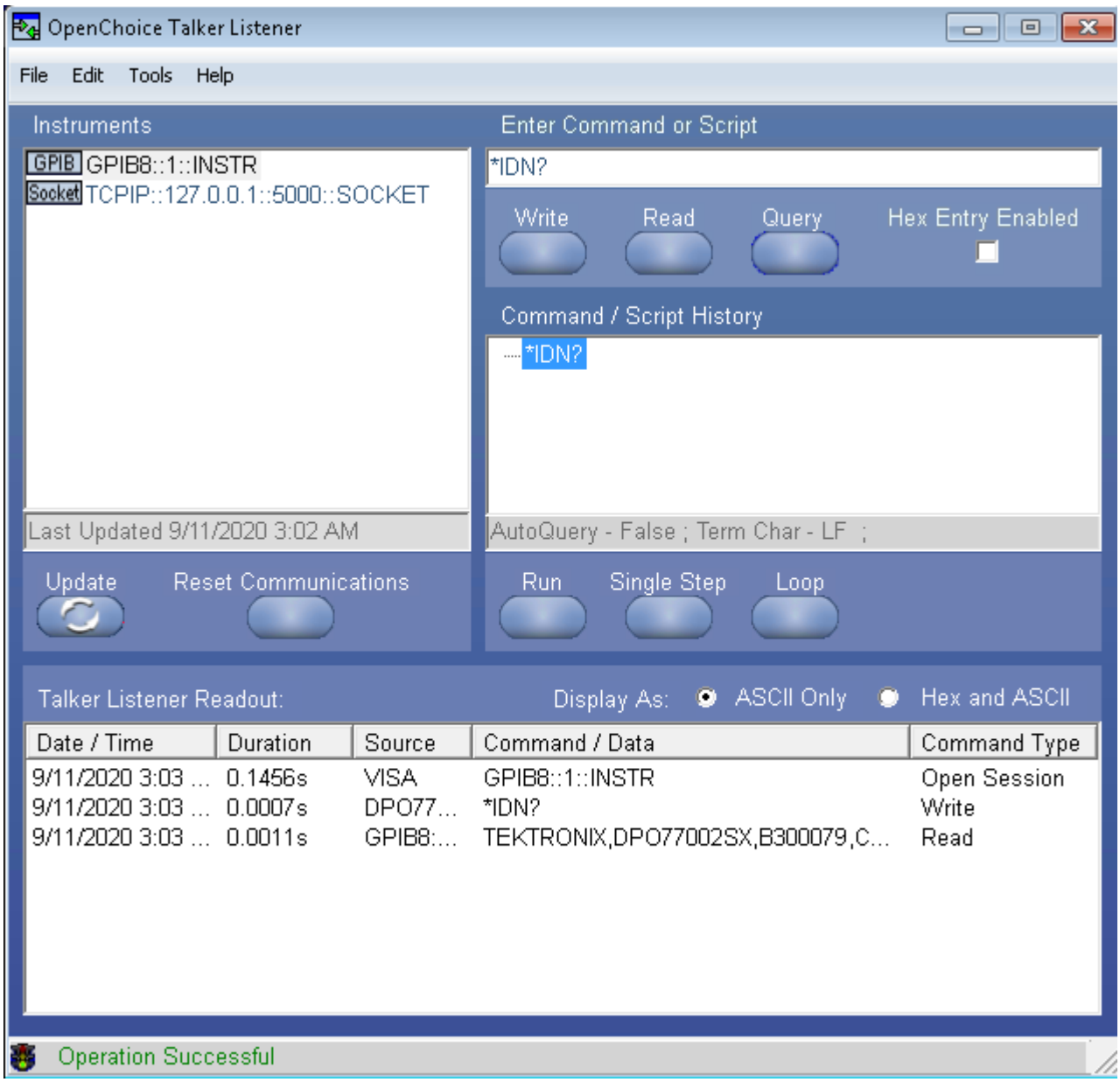
   Enter the Hostname as 127.0.0.1 if the TekVISA and TekExpress application are in the same system, else enter the IP address of the oscilloscope where the TekExpress application is running.



3. Click **Search** to setup the TCPIP connection with the host. Check whether the TCPIP host name is displayed in **OpenChoice Instrument Manager→ Instruments**.



4. Double-click **OpenChoice Talker Listener** and enter the Command *IDN? in command entry field and click **Query**. Check that the Operation is successful and Talker Listener Readout displays the Command / Data.



Set or query the device name of application

This command sets or queries the device name of the application.

Syntax

`TEKEXP:SELECT DEVICE,"<DeviceName>"` (Set)

`TEKEXP:SELECT? DEVICE` (Query)

Command arguments

Argument Name	Argument Type
<DeviceName>	<String>

Returns

<String>

Examples

`TEKEXP:SELECT DEVICE,"<DUT001>"` command sets the device name of the application to DUT001.

`TEKEXP:SELECT? DEVICE` command returns the selected device name of the application.

Set or query the DUTID of application

This command sets or queries the DUTID of the application.

Syntax

`TEKEXP:VALUE DUTID,"<Value>"` (Set)

`TEKEXP:VALUE? DUTID` (Query)

Command arguments

Argument Name	Argument Type
<Value>	<String>

Returns

<String>

Examples

`TEKEXP:VALUE DUTID,"DUT001"` command sets the DUTID of the application to DUT001.

`TEKEXP:VALUE? DUTID` command returns the DUTID of the application.

Set or query the suite name of the application

This command sets or queries the suite name of the application.

Syntax

`TEKEXP:SELECT SUITE,"<SuiteName>"` (Set)

`TEKEXP:SELECT? SUITE` (Query)

Command arguments

Returns

<String>

Examples

`TEKEXP:SELECT SUITE,"<SuiteName>"` command sets the suite name of the application.

`TEKEXP:SELECT? SUITE` command returns the selected suite of the application.

Set or query the test name of the application

This command selects or deselects the specified test name of the application.

Syntax

`TEKEXP:SELECT TEST,"<TestName>",<Value>` (Set)

`TEKEXP:SELECT? TEST` (Query)

Command arguments

TestName	Value
UHBR10	
▪ Preset Optimization Measurement UHBR10 TP2 ▪ Preset Optimization Measurement UHBR10 TP3_EQ ▪ Eye height Testing UHBR10 TP2 ▪ Eye width testing UHBR10 TP2 ▪ Total Jitter Measurement (TJ) UHBR10 TP2 ▪ Random Jitter (RJ) Measurement UHBR10 TP2 ▪ UDJ Measurement UHBR10 TP2 ▪ LFUDJ Measurement UHBR10 TP2 ▪ DDJ Measurement UHBR10 TP2 ▪ UJ Measurement UHBR10 TP2 ▪ SSC Phase Deviation Measurement UHBR10 TP2 ▪ SSC Down Spread Rate Measurement UHBR10 TP2 ▪ SSC Down Spread Range Measurement UHBR10 TP2 ▪ SSC Slew Rate Measurement UHBR10 TP2 ▪ UI Measurement UHBR10 TP2 ▪ Bit Rate Measurement UHBR10 TP2 ▪ Electrical Idle Measurement UHBR10 TP2 ▪ AC Common Mode Measurement UHBR10 TP2 ▪ Eye Height Testing UHBR10 TP3_EQ ▪ Eye Width Testing UHBR10 TP3_EQ ▪ Total Jitter (TJ) Measurement UHBR10 TP3_EQ ▪ Random Jitter (RJ) Measurement UHBR10 TP3_EQ ▪ UDJ Measurement UHBR10 TP3_EQ ▪ DDJ Measurement UHBR10 TP3_EQ ▪ UJ Measurement UHBR10 TP3_EQ ▪ LFUDJ Measurement UHBR10 TP3_EQ ▪ TXEQ Preset 0 UHBR10 ▪ TXEQ Preset 1 UHBR10 ▪ TXEQ Preset 2 UHBR10 ▪ TXEQ Preset 3 UHBR10 ▪ TXEQ Preset 4 UHBR10 ▪ TXEQ Preset 5 UHBR10 ▪ TXEQ Preset 6 UHBR10 ▪ TXEQ Preset 7 UHBR10 ▪ TXEQ Preset 8 UHBR10 ▪ TXEQ Preset 9 UHBR10 ▪ TXEQ Preset 10 UHBR10	{True | False} or {1 | 0} It represents selected or unselected. Where, True or 1 - Selected False or 0 - Unselected

TestName	Value
▪ TXEQ Preset 11 UHBR10 ▪ TXEQ Preset 12 UHBR10 ▪ TXEQ Preset 13 UHBR10 ▪ TXEQ Preset 14 UHBR10 ▪ TXEQ Preset 15 UHBR10	
UHBR13.5	
▪ Preset Optimization Measurement UHBR13.5 TP2 ▪ Preset Optimization Measurement UHBR13.5 TP3_EQ ▪ Eye height Testing UHBR13.5 TP2 ▪ Eye width testing UHBR13.5 TP2 ▪ Total Jitter Measurement (TJ) UHBR13.5 TP2 ▪ Random Jitter (RJ) Measurement UHBR13.5 TP2 ▪ UDJ Measurement UHBR13.5 TP2 ▪ LFUDJ Measurement UHBR13.5 TP2 ▪ DDJ Measurement UHBR13.5 TP2 ▪ UJ Measurement UHBR13.5 TP2 ▪ SSC Phase Deviation Measurement UHBR13.5 TP2 ▪ SSC Down Spread Rate Measurement UHBR13.5 TP2 ▪ SSC Down Spread Range Measurement UHBR13.5 TP2 ▪ SSC Slew Rate Measurement UHBR13.5 TP2 ▪ UI Measurement UHBR13.5 TP2 ▪ Bit Rate Measurement UHBR13.5 TP2 ▪ Electrical Idle Measurement UHBR13.5 TP2 ▪ AC Common Mode Measurement UHBR13.5 TP2 ▪ Eye Height Testing UHBR13.5 TP3_EQ ▪ Eye Width Testing UHBR13.5 TP3_EQ ▪ Total Jitter (TJ) Measurement UHBR13.5 TP3_EQ ▪ Random Jitter (RJ) Measurement UHBR13.5 TP3_EQ ▪ UDJ Measurement UHBR13.5 TP3_EQ ▪ DDJ Measurement UHBR13.5 TP3_EQ ▪ UJ Measurement UHBR13.5 TP3_EQ ▪ LFUDJ Measurement UHBR13.5 TP3_EQ ▪ TXEQ Preset 0 UHBR13.5 ▪ TXEQ Preset 1 UHBR13.5 ▪ TXEQ Preset 2 UHBR13.5 ▪ TXEQ Preset 3 UHBR13.5 ▪ TXEQ Preset 4 UHBR13.5 ▪ TXEQ Preset 5 UHBR13.5 ▪ TXEQ Preset 6 UHBR13.5 ▪ TXEQ Preset 7 UHBR13.5 ▪ TXEQ Preset 8 UHBR13.5	{True | False} or {1 | 0} It represents selected or unselected. Where, True or 1 - Selected False or 0 - Unselected

TestName	Value
▪ TXEQ Preset 9 UHBR13.5 ▪ TXEQ Preset 10 UHBR13.5 ▪ TXEQ Preset 11 UHBR13.5 ▪ TXEQ Preset 12 UHBR13.5 ▪ TXEQ Preset 13 UHBR13.5 ▪ TXEQ Preset 14 UHBR13.5 ▪ TXEQ Preset 15 UHBR13.5	
UHBR20	
▪ Preset Optimization Measurement UHBR20 TP2 ▪ Preset Optimization Measurement UHBR20 TP3_EQ ▪ Eye height Testing UHBR20 TP2 ▪ Eye width testing UHBR20 TP2 ▪ Total Jitter Measurement (TJ) UHBR20 TP2 ▪ Random Jitter (RJ) Measurement UHBR20 TP2 ▪ UDJ Measurement UHBR20 TP2 ▪ LFUDJ Measurement UHBR20 TP2 ▪ DDJ Measurement UHBR20 TP2 ▪ UJ Measurement UHBR20 TP2 ▪ SSC Phase Deviation Measurement UHBR20 TP2 ▪ SSC Down Spread Rate Measurement UHBR20 TP2 ▪ SSC Down Spread Range Measurement UHBR20 TP2 ▪ SSC Slew Rate Measurement UHBR20 TP2 ▪ UI Measurement UHBR20 TP2 ▪ Bit Rate Measurement UHBR20 TP2 ▪ Electrical Idle Measurement UHBR20 TP2 ▪ AC Common Mode Measurement UHBR20 TP2 ▪ Eye Height Testing UHBR20 TP3_EQ ▪ Eye Width Testing UHBR20 TP3_EQ ▪ Total Jitter (TJ) Measurement UHBR20 TP3_EQ ▪ Random Jitter (RJ) Measurement UHBR20 TP3_EQ ▪ UDJ Measurement UHBR20 TP3_EQ ▪ DDJ Measurement UHBR20 TP3_EQ ▪ UJ Measurement UHBR20 TP3_EQ ▪ LFUDJ Measurement UHBR20 TP3_EQ ▪ TXEQ Preset 0 UHBR20 ▪ TXEQ Preset 1 UHBR20 ▪ TXEQ Preset 2 UHBR20 ▪ TXEQ Preset 3 UHBR20 ▪ TXEQ Preset 4 UHBR20 ▪ TXEQ Preset 5 UHBR20 ▪ TXEQ Preset 6 UHBR20 ▪ TXEQ Preset 7 UHBR20 ▪ TXEQ Preset 8 UHBR20	{True | False} or {1 | 0} It represents selected or unselected. Where, True or 1 - Selected False or 0 - Unselected

TestName	Value
▪ TXEQ Preset 9 UHBR20 ▪ TXEQ Preset 10 UHBR20 ▪ TXEQ Preset 11 UHBR20 ▪ TXEQ Preset 12 UHBR20 ▪ TXEQ Preset 13 UHBR20 ▪ TXEQ Preset 14 UHBR20 ▪ TXEQ Preset 15 UHBR20	

Returns

{True | False} or {1 | 0}

Examples

`TEKEXP:SELECT TEST,"<TestName>",1` command selects the specified test in the Test Panel.

`TEKEXP:SELECT? TEST` command returns the list of selected tests.

Set or query the version name of the application

This command sets or queries the version name of the application.

Syntax

`TEKEXP:SELECT VERSION,”<VersionName>”` (Set)

`TEKEXP:SELECT? VERSION` (Query)

Command arguments

Argument Name	Argument Type	Valid Values
<VersionName>	<String>	It is the name of the version on the DUT panel of the application.

Returns

<String>

Examples

`TEKEXP:SELECT VERSION,”<VersionName>”` command sets the version name of application.

`TEKEXP:SELECT? VERSION` command returns the version name of application.

Set or query the general parameter values

This command sets or queries the general parameter values of the application.

Syntax

`TEKEXP:VALUE GENERAL,"<ParameterName>","<Value>"` (Set)

`TEKEXP:VALUE? GENERAL,"<ParameterName>"` (Query)

General command parameters

ParameterName	Value
Connector Type	▪ Enhanced DP ▪ Type C ▪ mDP
UHBR10	▪ Included ▪ Excluded
UHBR13.5	▪ Included ▪ Excluded
UHBR20	▪ Included ▪ Excluded
Voltage swing-800mV	▪ Included ▪ Excluded
Lane0_SignalPreset_UHBR10 TP2 Lane1_SignalPreset_UHBR10 TP2 Lane2_SignalPreset_UHBR10 TP2 Lane3_SignalPreset_UHBR10 TP2	▪ P0 ▪ P01 ▪ P02 ▪ P03 ▪ P04 ▪ P05 ▪ P06 ▪ P07 ▪ P08 ▪ P09 ▪ P10 ▪ P11 ▪ P12 ▪ P13 ▪ P14 ▪ P15
Lane0_SignalPreset_UHBR10 TP3_EQ Lane1_SignalPreset_UHBR10 TP3_EQ Lane2_SignalPreset_UHBR10 TP3_EQ Lane3_SignalPreset_UHBR10 TP3_EQ	▪ P0 ▪ P01 ▪ P02 ▪ P03 ▪ P04 ▪ P05 ▪ P06 ▪ P07 ▪ P08 ▪ P09 ▪ P10 ▪ P11 ▪ P12 ▪ P13 ▪ P14 ▪ P15

ParameterName	Value
Lane0_SignalPreset_UHBR13.5 TP2 Lane1_SignalPreset_UHBR13.5 TP2 Lane2_SignalPreset_UHBR13.5 TP2 Lane3_SignalPreset_UHBR13.5 TP2	▪ P0 ▪ P01 ▪ P02 ▪ P03 ▪ P04 ▪ P05 ▪ P06 ▪ P07 ▪ P08 ▪ P09 ▪ P10 ▪ P11 ▪ P12 ▪ P13 ▪ P14 ▪ P15
Lane0_SignalPreset_UHBR13.5 TP3_EQ Lane1_SignalPreset_UHBR13.5 TP3_EQ Lane2_SignalPreset_UHBR13.5 TP3_EQ Lane3_SignalPreset_UHBR13.5 TP3_EQ	▪ P0 ▪ P01 ▪ P02 ▪ P03 ▪ P04 ▪ P05 ▪ P06 ▪ P07 ▪ P08 ▪ P09 ▪ P10 ▪ P11 ▪ P12 ▪ P13 ▪ P14 ▪ P15

ParameterName	Value
Lane0_SignalPreset_UHBR20 TP2 Lane1_SignalPreset_UHBR20 TP2 Lane2_SignalPreset_UHBR20 TP2 Lane3_SignalPreset_UHBR20 TP2	▪ P0 ▪ P01 ▪ P02 ▪ P03 ▪ P04 ▪ P05 ▪ P06 ▪ P07 ▪ P08 ▪ P09 ▪ P10 ▪ P11 ▪ P12 ▪ P13 ▪ P14 ▪ P15
Lane0_SignalPreset_UHBR20 TP3_EQ Lane1_SignalPreset_UHBR20 TP3_EQ Lane2_SignalPreset_UHBR20 TP3_EQ Lane3_SignalPreset_UHBR20 TP3_EQ	▪ P0 ▪ P01 ▪ P02 ▪ P03 ▪ P04 ▪ P05 ▪ P06 ▪ P07 ▪ P08 ▪ P09 ▪ P10 ▪ P11 ▪ P12 ▪ P13 ▪ P14 ▪ P15
SSC	▪ SSC Enable ▪ SSC Disable ▪ Both
Link Widths	▪ 1 Lane ▪ 2 Lanes ▪ 4 Lanes
DUT control	▪ Manual ▪ UCD-323
FilterfileDeEmbedPos	`C:\Users\Public\Tektronix\TekApplications\DisplayPort20\Filters\WT_Enhanced_mDP_Plug_wo_conn_Pos.flt`

ParameterName	Value
FilterfileDeEmbedNeg	`C:\Users\Public\Tektronix\TekApplications\DisplayPort20\Filters\WT_Enhanced_mDP_Plug_wo_conn_Neg.flt`
FilterfileDeEmbedDiff	`C:\Users\Public\Tektronix\TekApplications\DisplayPort20\Filters\WT_Enhanced_mDP_Plug_wo_conn_Diff.flt`
Signal Validation	▪ Skip validation ▪ Skip test if validation fails ▪ Prompt if validation fails ▪ Validate pattern but use pattern as is
Number of Runs	1 to 250
Timer Warning Info Message Popup	▪ TRUE ▪ FALSE
Timer Warning Info Message Popup Duration	1 to 60
Timer Error Message Popup	▪ TRUE ▪ FALSE
Timer Error Message Popup	1 to 60

Returns

<NRf> or <String>

Examples

`TEKEXP:VALUE GENERAL,"<ParameterName>","<Value>"` command set the value for the specified general parameter.

`TEKEXP:VALUE? GENERAL,"<ParameterName>"` command returns the value for the specified general parameter.

Set or query the acquire parameter values

This command sets or queries the acquire parameter values of the application.

Syntax

`TEKEXP:VALUE ACQUIRE,”<TestName>","<AcquireType>”,”<ParameterName>","<ParameterValue>"` (Set)

`TEKEXP:VALUE? ACQUIRE,”<TestName>","<AcquireType>”,”<ParameterName>"` (Query)

Command arguments

Test Name	AcquireType	ParameterName	ParameterValue
▪ Preset Optimization Measurement UHBR10 TP2 ▪ Preset Optimization Measurement UHBR10 TP3_EQ ▪ Total Jitter (TJ) Measurement UHBR10 TP2 ▪ Total Jitter (TJ) Measurement UHBR10 TP3_EQ ▪ Random Jitter (RJ) Measurements UHBR10 TP2 ▪ Random Jitter (RJ) Measurements UHBR10 TP3_EQ ▪ UDJ Measurement UHBR10 TP2 ▪ UDJ Measurement UHBR10 TP3_EQ ▪ LFUDJ Measurement UHBR10 TP2 ▪ LFUDJ Measurement UHBR10 TP3_EQ ▪ DDJ Measurement UHBR10 TP2 ▪ DDJ Measurement UHBR10 TP3_EQ ▪ UJ Measurement UHBR10 TP2 ▪ UJ Measurement UHBR10 TP3_EQ ▪ AC Common Mode Measurement UHBR10 TP2	UHBR10 PRBS15	▪ SignalPreset_UHBR10 TP2 ▪ SignalPreset_UHBR10 TP3_EQ	▪ P0 ▪ P01 ▪ P02 ▪ P03 ▪ P04 ▪ P05 ▪ P06 ▪ P07 ▪ P08 ▪ P09 ▪ P10 ▪ P11 ▪ P12 ▪ P13 ▪ P14 ▪ P15
▪ Preset Optimization Measurement UHBR13.5 TP2 ▪ Preset Optimization Measurement UHBR13.5 TP3_EQ ▪ Total Jitter (TJ) Measurement UHBR13.5 TP2 ▪ Total Jitter (TJ) Measurement UHBR13.5 TP3_EQ ▪ Random Jitter (RJ) Measurements UHBR13.5 TP2 ▪ Random Jitter (RJ) Measurements UHBR13.5 TP3_EQ ▪ UDJ Measurement UHBR13.5 TP2 ▪ UDJ Measurement UHBR13.5 TP3_EQ ▪ LFUDJ Measurement UHBR13.5 TP2 ▪ LFUDJ Measurement UHBR13.5 TP3_EQ ▪ DDJ Measurement UHBR13.5 TP2 ▪ DDJ Measurement UHBR13.5 TP3_EQ ▪ UJ Measurement UHBR13.5 TP2 ▪ UJ Measurement UHBR13.5 TP3_EQ ▪ AC Common Mode Measurement UHBR13.5 TP2	UHBR13.5 PRBS15	▪ SignalPreset_UHBR13.5 TP2 ▪ SignalPreset_UHBR13.5 TP3_EQ	▪ P0 ▪ P01 ▪ P02 ▪ P03 ▪ P04 ▪ P05 ▪ P06 ▪ P07 ▪ P08 ▪ P09 ▪ P10 ▪ P11 ▪ P12 ▪ P13 ▪ P14 ▪ P15

Test Name	AcquireType	ParameterName	ParameterValue
▪ Preset Optimization Measurement UHBR20 TP2 ▪ Preset Optimization Measurement UHBR20 TP3_EQ ▪ Total Jitter (TJ) Measurement UHBR20 TP2 ▪ Total Jitter (TJ) Measurement UHBR20 TP3_EQ ▪ Random Jitter (RJ) Measurements UHBR20 TP2 ▪ Random Jitter (RJ) Measurements UHBR20 TP3_EQ ▪ UDJ Measurement UHBR20 TP2 ▪ UDJ Measurement UHBR20 TP3_EQ ▪ LFUDJ Measurement UHBR20 TP2 ▪ LFUDJ Measurement UHBR20 TP3_EQ ▪ DDJ Measurement UHBR20 TP2 ▪ DDJ Measurement UHBR20 TP3_EQ ▪ UJ Measurement UHBR20 TP2 ▪ UJ Measurement UHBR20 TP3_EQ ▪ AC Common Mode Measurement UHBR20 TP2	UHBR20 PRBS15	▪ SignalPreset_UHBR20 TP2 ▪ SignalPreset_UHBR20 TP3_EQ	▪ P0 ▪ P01 ▪ P02 ▪ P03 ▪ P04 ▪ P05 ▪ P06 ▪ P07 ▪ P08 ▪ P09 ▪ P10 ▪ P11 ▪ P12 ▪ P13 ▪ P14 ▪ P15
▪ Eye height testing UHBR10 TP2 ▪ Eye height testing UHBR10 TP3_EQ ▪ Eye width testing UHBR10 TP2 ▪ Eye width testing UHBR10 TP3_EQ ▪ SSC Phase Deviation Measurement UHBR10 TP2 ▪ SSC Down Spread Rate Measurement UHBR10 TP2 ▪ SSC Down Spread Range Measurement UHBR10 TP2 ▪ SSC Slew Rate Measurement UHBR10 TP2 ▪ UI Measurement UHBR10 TP2 ▪ Bit Rate Measurement UHBR10 TP2	UHBR10 PRBS31	▪ SignalPreset_UHBR10 TP2 ▪ SignalPreset_UHBR10 TP3_EQ	▪ P0 ▪ P01 ▪ P02 ▪ P03 ▪ P04 ▪ P05 ▪ P06 ▪ P07 ▪ P08 ▪ P09 ▪ P10 ▪ P11 ▪ P12 ▪ P13 ▪ P14 ▪ P15

Test Name	AcquireType	ParameterName	ParameterValue
▪ Eye height testing UHBR13.5 TP2 ▪ Eye height testing UHBR13.5 TP3_EQ ▪ Eye width testing UHBR13.5 TP2 ▪ Eye width testing UHBR13.5 TP3_EQ ▪ SSC Phase Deviation Measurement UHBR13.5 TP2 ▪ SSC Down Spread Rate Measurement UHBR13.5 TP2 ▪ SSC Down Spread Range Measurement UHBR13.5 TP2 ▪ SSC Slew Rate Measurement UHBR13.5 TP2 ▪ UI Measurement UHBR13.5 TP2 ▪ Bit Rate Measurement UHBR13.5 TP2	UHBR13.5 PRBS31	▪ SignalPreset_UHBR13.5 TP2 ▪ SignalPreset_UHBR13.5 TP3_EQ	▪ P0 ▪ P01 ▪ P02 ▪ P03 ▪ P04 ▪ P05 ▪ P06 ▪ P07 ▪ P08 ▪ P09 ▪ P10 ▪ P11 ▪ P12 ▪ P13 ▪ P14 ▪ P15
▪ Eye height testing UHBR20 TP2 ▪ Eye height testing UHBR20 TP3_EQ ▪ Eye width testing UHBR20 TP2 ▪ Eye width testing UHBR20 TP3_EQ ▪ SSC Phase Deviation Measurement UHBR20 TP2 ▪ SSC Down Spread Rate Measurement UHBR20 TP2 ▪ SSC Down Spread Range Measurement UHBR20 TP2 ▪ SSC Slew Rate Measurement UHBR20 TP2 ▪ UI Measurement UHBR20 TP2 ▪ Bit Rate Measurement UHBR20 TP2	UHBR20 PRBS31	▪ SignalPreset_UHBR20 TP2 ▪ SignalPreset_UHBR20 TP3_EQ	▪ P0 ▪ P01 ▪ P02 ▪ P03 ▪ P04 ▪ P05 ▪ P06 ▪ P07 ▪ P08 ▪ P09 ▪ P10 ▪ P11 ▪ P12 ▪ P13 ▪ P14 ▪ P15

Test Name	AcquireType	ParameterName	ParameterValue
Electrical Idle Measurement UHBR10 TP2	UHBR10 ElecIdle	SignalPreset_UHBR10 TP2	▪ P0 ▪ P01 ▪ P02 ▪ P03 ▪ P04 ▪ P05 ▪ P06 ▪ P07 ▪ P08 ▪ P09 ▪ P10 ▪ P11 ▪ P12 ▪ P13 ▪ P14 ▪ P15
Electrical Idle Measurement UHBR13.5 TP2	UHBR13.5 ElecIdle	SignalPreset_UHBR13.5 TP2	▪ P0 ▪ P01 ▪ P02 ▪ P03 ▪ P04 ▪ P05 ▪ P06 ▪ P07 ▪ P08 ▪ P09 ▪ P10 ▪ P11 ▪ P12 ▪ P13 ▪ P14 ▪ P15

Test Name	AcquireType	ParameterName	ParameterValue
Electrical Idle Measurement UHBR20 TP2	UHBR20 ElecIdle	SignalPreset_UHBR20 TP2	▪ P0 ▪ P01 ▪ P02 ▪ P03 ▪ P04 ▪ P05 ▪ P06 ▪ P07 ▪ P08 ▪ P09 ▪ P10 ▪ P11 ▪ P12 ▪ P13 ▪ P14 ▪ P15

Returns

<Nrf>

Examples

`TEKEXP:VALUE ACQUIRE,”<TestName>",”<AcquireType>”,"<ParameterName>","<ParameterValue>"` command sets the value for the specified test and its acquire parameter.

`TEKEXP:VALUE? ACQUIRE,”<TestName>",”<AcquireType>”,"<ParameterName>"` command returns the value for the specified test and its acquire parameter.

Set or query the analyze parameter values

This command sets or queries the analyze parameter values of the application.

Syntax

`TEKEXP:VALUE ANALYZE,”<TestName>","<ParameterName>","<ParameterValue>"` (Set)

`TEKEXP:VALUE? ANALYZE,”<TestName>","<ParameterName>"` (Query)

TestName	ParameterName	ParameterValue
Eye Diagram Testing	Cable filter file	File Path

Returns

<Nrf>

Examples

`TEKEXP:VALUE ANALYZE,”<TestName>","<ParameterName>","<ParameterValue>"` command set the value for the specified test and its analyze parameter.

`TEKEXP:VALUE? ANALYZE,”<TestName>","<ParameterName>"` command returns the value for the specified test and its analyze parameter.

Query the available devices in the DUT panel of the application

This command queries the list of available devices on the DUT panel as comma separated values.

Syntax

`TEKEXP:LIST? DEVICE` (Query)

Command arguments

Device	Device Type and value	Description
<Device>	<String>	It is the name of the device on the DUT panel of the application.

Returns

<String>

Examples

`TEKEXP:LIST? DEVICE` command returns the list of available devices.

Query the available suites for the selected device

This command queries the list of available suites for the selected device as comma separated values.

Syntax

`TEKEXP:LIST? SUITE` (Query)

Returns

<String>

Examples

`TEKEXP:LIST? SUITE` command returns the list of available suites for the selected device.

Query the list of available tests of the application

This command queries the list of available tests of the application for the selected device as comma separated values.

Syntax

`TEKEXP:LIST? TEST` (Query)

Command arguments

Returns

<String>

Examples

`TEKEXP:LIST? TEST` command returns the list of available tests for the selected device.

Query the available version names of the application

This command queries the list of available version names of the application for the selected device as comma separated values.

Syntax

`TEKEXP:LIST? VERSION` (Query)

Returns

<String>

Examples

`TEKEXP:LIST? VERSION` command returns the list of version names for the selected device.

Query the list of available instruments based on the specified instrument type

This command queries the list of available instruments based on the specified instrument type.

Syntax

`TEKEXP:LIST? INSTRUMENT,"<InstrumentType>"` (Query)

Command argument

Argument Name	Argument value
<InstrumentType>	<String>

Returns

<String>

Examples

`TEKEXP:LIST? INSTRUMENT,"Real Time Scope"` command returns the list of available instruments based on the real time scope type.

Set or query the IP address of the instrument based on the specified instrument type

This command sets or queries the IP address of the instrument based on the specified instrument type.

Syntax

`TEKEXP:INSTRUMENT? "<InstrumentType>"` (Query)

`TEKEXP:INSTRUMENT, "<InstrumentType>","<Value>"` (Set)

Command argument

Argument Name	Argument Type
<InstrumentType>	<String>
<Value>	<String> TCPIP::XXX.XX.XXX.XXX::INSTR

Returns

<String>

Examples

`TEKEXP:INSTRUMENT? "<InstrumentType>"` command returns the IP address of the oscilloscope.

`TEKEXP:INSTRUMENT, "<InstrumentType>","<value>"` command sets the oscilloscope to the specified IP address.

Query the information of the generated report file

This command queries the information of the generated report file in the format "<FileSize>","<FileName>".

Pre-requisite

A session should be run earlier and the report should be generated to get the information of the report.

Syntax

`TEKEXP:INFO? REPORT` (Query)

Returns

<FileSize>:: <String>

<FileName>:: <String>

Examples

`TEKEXP:INFO? REPORT` command returns the information of the generated report in the format ("1215","DUT001.mht").

Query the information of the generated waveform files

This command queries the information of the generated waveform files in the format.

<File1Size,"File1Name">.

If there are more than one waveform, the waveform file names are displayed with the comma separated values in the format

<File1Size,"File1Name">,<File2Size,"File2Name">.

Syntax

`TEKEXP:INFO? WFM` (Query)

Returns

<FileSize>:: <String>

<FileName>:: <String>

Examples

`TEKEXP:INFO? WFM` command returns the information of the generated waveform in the format (20000858,"X:\Display Port 2.1\Untitled Session\DUT001\20200916_041609\Iter1_Short Record-length for SCOPE Period_NoSSC_DIFF.wfm”).

Query the information of the generated image files

This command queries the information of the generated image files in the format.

<File1Size,"File1Name”>.

If there are more than one image, the image file names are displayed with the comma separated values in the format

<File1Size,"File1Name">,<File2Size,"File2Name">.

Syntax

`TEKEXP:INFO? IMAGE` (Query)

Returns

<FileSize>:: <String>

<FileName>:: <String>

Examples

`TEKEXP:INFO? IMAGE` command returns the information of the generated image in the format (109058, "X:\Display Port 2.1\Untitled Session\DUT001\20200916_041609\Iter1_Short Record-length for SCOPE Period_NoSSC_DIFF.png";22794,"X:\Display Port 2.1\Untitled Session\DUT001\20200916_041609\ScopePeriodPlot_Iteration1WithCursor.png").

Query the active TekExpress application name

This command queries the active TekExpress application name running on the oscilloscope.

Syntax

`TEKEXP:*IDN?` (Query)

Returns

<String>

Examples

`TEKEXP:*IDN?` command returns the active TekExpress application name running on the oscilloscope.

Sets or query the acquire mode status

This command sets or queries the acquire mode status.

Syntax

`TEKEXP:ACQUIRE_MODE <Mode>` (Set)

`TEKEXP:ACQUIRE_MODE?` (Query)

Command arguments

Argument Name	Argument value
<Mode>	▪ LIVE ▪ PRE-RECORDED

Returns

LIVE | PRE-RECORDED

Examples

`TEKEXP:ACQUIRE_MODE LIVE` command sets the acquire mode to the Live mode.

`TEKEXP:ACQUIRE_MODE?` command returns the current acquire mode.

Set or query the execution mode status

This command sets or queries the execution mode status.

Syntax

`TEKEXP:MODE <Mode>` (Set)

`TEKEXP:MODE?` (Query)

Command arguments

Argument Name	Argument value
<Mode>	▪ COMPLIANCE ▪ USER-DEFINED

Returns

COMPLIANCE | USER-DEFINED

Examples

`TEKEXP:MODE COMPLIANCE` command sets the execution mode to the compliance mode.

`TEKEXP:MODE?` command returns the current execution mode.

Generate the report for the current session

This command generates the report for the current session.

Syntax

`TEKEXP:REPORT GENERATE`(Set)

Arguments

N/A

Examples

`TEKEXP:REPORT GENERATE` command generates the report for the current session.

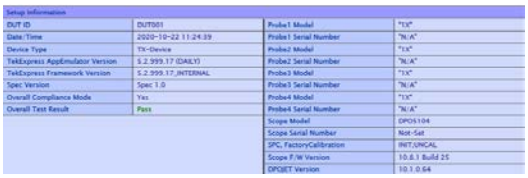
Query the value of specified report header field in the report

This command queries the value of specified report header field in the report.

Syntax

`TEKEXP:REPORT? ”<Device Field>”` (Query)

Command arguments

Argument Name	Argument Type
<Device Field> Device field is the header name of each field in the setup information section of the report. 	<String>

Setup Information			
DUT ID	DUT001	Probe1 Model	"TX"
Date/Time	2020-10-22 11:24:39	Probe1 Serial Number	"N/A"
Device Type	TX-Device	Probe2 Model	"TX"
TekExpress AppEmulator Version	5.2.999.17 (DAILY)	Probe2 Serial Number	"N/A"
TekExpress Framework Version	5.2.999.17_INTERNAL	Probe3 Model	"TX"
Spec Version	Spec 1.0	Probe3 Serial Number	"N/A"
Overall Compliance Mode	Yes	Probe4 Model	"TX"
Overall Test Result	Pass	Probe4 Serial Number	"N/A"
		Scope Model	DPO5104
		Scope Serial Number	Not-Set
		SPC, FactoryCalibration	INIT,UNCAL
		Scope F/W Version	10.6.1 Build 25
		DPOJET Version	10.1.0.64

Returns

<String>

Examples

`TEKEXP:REPORT? "DUT ID"` command returns the value of DUT ID field in the report.

Query the value of specified result detail available in report summary/details table

This command queries the value of specified result detail available in report summary/details table.

Syntax

`TEKEXP:RESULT? "<TestName>"` (Query)

`TEKEXP:RESULT? "<TestName>","<ColumnName>"` (Query)

`TEKEXP:RESULT? "<TestName>","<ColumnName>",<RowNumber>` (Query)

Command arguments

Argument Name	Argument Type
<TestName> It is the test name of which the details are required in the report.	<String>

Argument Name	Argument Type
<ColumnName> It is the column header name of which the details are required in the report.	<String>
<RowNumber> It is the row number of which the details are required in the report.	<String>

Returns

<String>

Examples

`TEKEXP:RESULT? "<TestName>"` will return the pass fail status of test.

`TEKEXP:RESULT? "<TestName>","<ColumnName>"` will return all the row values of specific column for the test with comma separated values.

`TEKEXP:RESULT? "<TestName>","<ColumnName>",<RowNumber>` will return the column value of specified row number.

Restore the setup to default settings

This command restores the setup to default settings.

Syntax

`TEKEXP:SETUP Default` (Set)

Arguments

N/A

Examples

`TEKEXP:SETUP Default` command restores the setup to default settings.

Save the settings to a specified session

This command saves the settings to a specified session.

Syntax

`TEKEXP:SETUP Save,"<SessionName>"`

Command arguments

Argument Name	Argument value
<SessionName>	<String>

Examples

`TEKEXP:SETUP Save,"<SessionName>"` command saves the settings to a specified session.

Open the setup from a specified session

This command opens the setup from a specified session.

Syntax

`TEKEXP:SETUP Open,"<SessionName>"` (Set)

Command arguments

Argument Name	Argument value
<SessionName>	<String>

Examples

`TEKEXP:SETUP Open,"<SessionName>"` command opens the setup from a specified session.

Query the current setup file name

This command queries the current setup file name.

Syntax

`TEKEXP:SETUP? CURRENT` (Query)

Returns

<String>

Examples

`TEKEXP:SETUP? CURRENT` command returns the current setup file name.

Run/stop/pause/resume the selected measurements execution in the application

This command run/stop/pause/resume the selected measurements execution in the application.

Syntax

`TEKEXP:STATE <operation mode>` (Set)

Command arguments

Argument Name	Argument value
<operation mode>	▪ RUN ▪ STOP ▪ PAUSE ▪ RESUME

Returns

RUN | STOP | PAUSE | RESUME

Examples

`TEKEXP:STATE RUN` command runs the execution for the selected measurements.

Query the current measurement execution status

This command queries the current measurement execution status.

Syntax

`TEKEXP:STATE?` (Query)

Returns

RUNNING | PAUSED | WAIT | ERROR | READY

Examples

`TEKEXP:STATE?` command returns the current measurement execution status.

Query whether the current setup is saved or not saved

This command queries whether the current setup is saved or not saved.

Syntax

`TEKEXP:STATE? SETUP` (Query)

Returns

Saved or Not-Saved

Examples

`TEKEXP:STATE? SETUP` command returns whether the current setup is saved or not saved.

Query the status of the previous command execution

This command queries whether the previous command execution is completed successfully.

Syntax

`TEKEXP:*OPC?` (Query)

Returns

{0 | 1} or {True | False}

1 or True indicates that command execution is successful.

0 or False indicates that command execution is failed.

Examples

`TEKEXP:*OPC?` command returns whether the previous command operation is completed successfully.

Query the last error occurred

This command queries the last error occurred.

Syntax

`TEKEXP:LASTERROR?` (Query)

Returns

<String>

Examples

`TEKEXP:LASTERROR?` command returns the last error occurred.

Set or query the popup details

This command sets or queries the popup details.

Syntax

`TEKEXP:POPUP?` (Query)

`TEKEXP:POPUP "<PopupResponse>"` (Set)

Command arguments

Argument Name	Argument value
<PopupResponse>	▪ Yes ▪ No

Returns

The pop-up details return in the following format:

"<Tittle>","<message>","<response1>,<response2>".

Where,

<Tittle> :: <String>

<message> :: <String>

<response1>,<response2> :: <String>

Examples

`TEKEXP:POPUP?` command returns the popup details in following format ": "Do you really want to exit TekExpress?";Responses: "Yes, No".

`TEKEXP:POPUP "Yes"` command sets the popup response to Yes.

Set or query the View report after generating option status

This command sets or queries the enable/disable status of the View report after generating function.

Syntax

`TEKEXP:VALUE? GENERAL,"View Report After Generating"` (Query)

`TEKEXP:VALUE GENERAL,"View Report After Generating",<value>` (Set)

Arguments

Argument Name	Argument value
<Value>	{True | False} or {1 | 0} It represents enabled or disabled. Where, ▪ True or 1 - enabled ▪ False or 0 - disabled

Returns

{True | False} or {0 | 1}

Examples

`TEKEXP:VALUE? GENERAL,"View Report After Generating"` command returns the enable or disable status of view report after generating option.

`TEKEXP:VALUE GENERAL,"View Report After Generating",<value>` command enable or disable the view report after generating option.

Set or query the enable/disable status of Verbose function

This command sets or queries the enable/disable status of Verbose function.

Syntax

`TEKEXP:VALUE VERBOSE,"<Value>"` (Set)

`TEKEXP:VALUE? VERBOSE` (Query)

Arguments

Argument Name	Argument value
<Value>	{True | False} or {1 | 0} It represents enabled or disabled. Where, ▪ True or 1 - enabled ▪ False or 0 - disabled

Returns

{True | False} or {0 | 1}

Examples

`TEKEXP:VALUE VERBOSE,"<Value>"` command enable or disable the Verbose function.

`TEKEXP:VALUE? VERBOSE` command returns the enable or disable status of Verbose function.

Set or query the waveform file recalled for the specified test name and acquire type

This command set or queries the waveform file recalled for the specified test name and acquire type.

If there are more than one waveform, the waveform file names are displayed with the symbol "$" separated values in the format

<WaveformFileName1$ WaveformFileName2>.

Syntax

`TEKEXP:VALUE WFMFILE,<TestName>,<AcquireType>,<WaveformFileName>` (Set)

`TEKEXP:VALUE? WFMFILE,<TestName>,<AquireType>` (Query)

Returns

<String>

Examples

`TEKEXP:VALUE WFMFILE,<TestName>,<AquireType>,<WaveformFileName>` command recalls the specified waveform file for the specified testname and acquire type.

`TEKEXP:VALUE? WFMFILE,<TestName>,<AquireType>` command returns the waveform file name recalled for the specified testname and acquire type.

Sets or query the limit values in the limits editor window

This command sets or queries the limit values in the limits editor window.

Syntax

`TEKEXP:VALUE LIMIT,<TestName>,<LimitHeader>,<Value1>,<CompareString>,<Value2>`(Set)

`TEKEXP:VALUE? LIMIT,<TestName>,<LimitHeader>` (Query)

Returns

<String> or <NRf>

Examples

`TEKEXP:VALUE LIMIT,<TestName>,<LimitHeader>,<Value1>,<CompareString>,<Value2>` command sets the limits value for the specified testname and limit header.

`TEKEXP:VALUE? LIMIT,<TestName>,<LimitHeader>` command returns the limits value for the specified testname and limit header.

Exit or close the application

The command exits or close the application.

Syntax

`TEKEXP:EXIT(Set)`

Examples

`TEKEXP:EXIT` command close the application.

Example

```
import socket
import time
#Create Socket
skt= socket.socket(socket.AF_INET,socket.SOCK_STREAM)
skt.connect(("localhost",5000))
#Measurement for execution
measurement = "Random Jitter (RJ) Measurements UHBR10 TP2"

#Setting the Mode to LIVE
skt.sendall("TEKEXP:ACQUIRE_MODE LIVE\n")
#setting the device
skt.sendall("TEKEXP:SELECT DEVICE,\"DisplayPort\"\n")
time.sleep (2)
skt.sendall("TEKEXP:SELECT? DEVICE\n")
time.sleep (2)
status=str(skt.recv(1024))
print "The selected device is : "+status

# Select the Suite
skt.sendall("TEKEXP:SELECT SUITE,\"Transmitter\"\n")
skt.sendall("TEKEXP:SELECT? SUITE\n")
time.sleep (5)
status=str(skt.recv(1024))
print "The selected Suite is : "+status

#GENERAL Parameters SCPI Commands
print "Started setting the GENERAL parameters"
#Set DUT ID
dutid = "DemoDUTID"
skt.sendall("TEKEXP:VALUE DUTID,"+dutid+"\n")
time.sleep(2)
skt.sendall("TEKEXP:VALUE? DUTID\n")
```

```
time.sleep (5)
status=str(skt.recv(1024))
print "After setting the DUT Id :"+status




#Exclude UHBR13.5 and UHBR20
skt.sendall("TEKEXP:VALUE GENERAL,UHBR13.5,\"Excluded\"\n")
time.sleep (2)
skt.sendall("TEKEXP:VALUE GENERAL,UHBR20,\"Excluded\"\n")
time.sleep (2)
skt.sendall('TEKEXP:SELECT GENERAL,SignalPreset_UHBR10,P0_\n')
time.sleep(5)
skt.sendall('TEKEXP:SELECT GENERAL,SSC,SSC_Enable\n')
time.sleep(5)
skt.sendall("TEKEXP:VALUE? GENERAL,UHBR10\n")
time.sleep (5)
#Select singlepreset
print "The selected Measurement is : "+measurement
status=str(skt.recv(1024))
print "Unselecting the UHBR135 and UHBR20 datarates :"+status
# Deselect All
skt.sendall('TEKEXP:SELECT TEST,ALL,FALSE'+'\n')
# Select Measurement
print "Select Measurement : "+measurement
skt.sendall('TEKEXP:SELECT TEST,'+'Random Jitter (RJ) Measurements UHBR10 TP2,'+'TRUE'+'\n')
time.sleep(5)
print "The selected Measurement is : "+measurement
# For de-selecting measurement use - skt.sendall("TEKEXP:SELECT TEST,"+""measurement""+"FALSE\n")
```

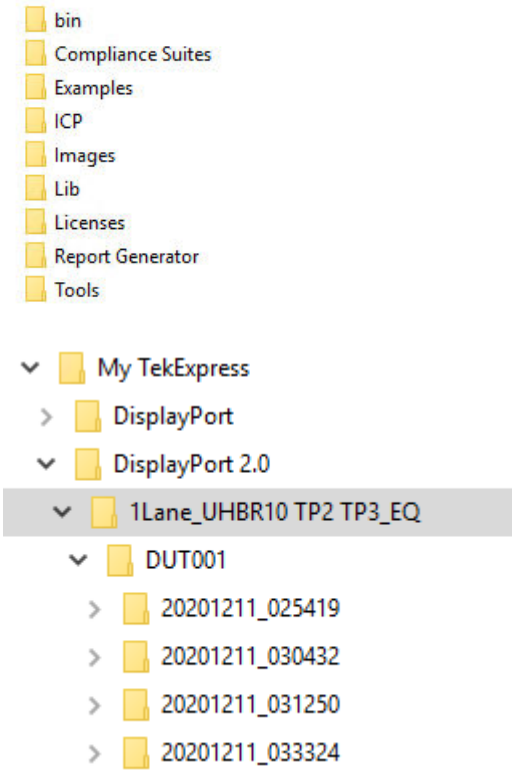
```
#Start running the selected Test
print "Starting Run"
skt.sendall("TEKEXP:STATE RUN\n")
print "Clicked start button."
time.sleep(5)
skt.sendall("TEKEXP:POPUP \"OK\"\n")
time.sleep(10)
skt.sendall("TEKEXP:STATE?\n")
time.sleep(5)
status = str(skt.recv(1024))
print "Hi"
status=status.strip()
while (status == "RUNNING" or status == "ERROR" or status=="WAIT"):
print "Running..."
skt.sendall("TEKEXP:STATE?\n")
time.sleep(2)
status = str(skt.recv(1024))
status = status.strip()
if status == "ERROR\n" or status=="WAIT\n":
skt.sendall("TEKEXP:POPUP?\n")
status = str(skt.recv(1024))
print status
popupResponse = raw_input("Enter popup response:")
skt.sendall("TEKEXP:POPUP "+"\""+popupResponse+"\""+"\n")
status = str(skt.recv(1024))
print "Measurement execution completed."
#Transfer the reports
print "Getting the info of Report file..."
skt.sendall("TEKEXP:INFO? REPORT\n")
status = str(skt.recv(1024))
print "ReportFile Info: "+status
fileInfo= status.split(',')
fileLength = long(fileInfo[0])
```

```
destinationPath = "C:\\"
print "Exporting report file to client location "+destinationPath+" ..."
skt.sendall("TEKEXP:EXPORT REPORT\n")
while(len(status) < fileLength):
received = skt.recv(fileLength)
status = status + received
fileName = fileInfo[1].strip()
fileName = fileName.strip('\"')
time.sleep(15)
f= open(destinationPath+fileName,'wb')
f.write(status)
f.close()
print "Export completed for "+fileName
#Saving Session
sessionName = 'PI_Session1'
skt.sendall("TEKEXP:SETUP SAVE,"+sessionName+"\n")
time.sleep (3)
print "Querying the result of ..."
skt.sendall("TEKEXP:RESULT? \"Test 3.1_Eye diagram testing\"\n")
time.sleep(5)
status = str(skt.recv(1024))
status=status.strip()
print "The result of"+measurement+"is"+status
skt.close()
```

References

Application directories

You can find the application files at C:\Program Files\Tektronix\Display Port 2.1. The application directory and associated files are organized as follows:



The following table lists the default directory names and their usage:

Application directories and usage

Directory names	Usage
Bin	Contains application libraries
Compliance Suites	Contains test suite specific files
Examples	Contains various support files
ICP	Contains instrument and application specific interface libraries
Images	Contains images of the application
Lib	Contains utility files specific to the application
Report Generator	Contains style sheets for report generation

Directory names	Usage
Tools	Contains instrument and application specific files

File name extensions

The TekExpress Display Port 2.1 software uses the following file name extensions:

File name extension

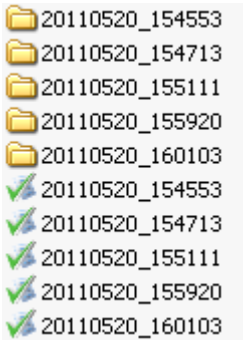
File name extension	Description
*.TekX	Application session files (the extensions may not be displayed)
*.py	Python sequence file.
*.xml	Test-specific configuration information (encrypted) files. Application log files
*.csv	Test result reports Plot data
*.mht	Test result reports (default) Test reports can also be saved in HTML format
*.pdf	Test result reports Application help document
*.xslt	Style sheet used to generate reports
*.png	Captured images

View test-related files

Files related to tests are stored in My DocumentsDisplay Port 2.1\Untitled session folder. Each test setup in this folder has both a test setup file and a test setup folder, both with the test setup name. The test setup file is preceded by the TekExpress icon.

Inside the test setup folder is another folder named for the DUT ID used in the test sessions. The default is DUT001.

Inside the DUT001 folder are the session folders and files. Each session also has a folder and file pair, both named for the test session using the naming convention (date)_(time). Each session file is stored outside its matching session folder:



Each session folder contains image files of any plots generated from running the test session. If you selected to save all waveforms or ran tests using prerecorded waveform files, these are included here.

The first time you run a new, unsaved session, the session files are stored in the Untitled Session folder located at X:\Display Port 2.1. When you name and save the session, the files are placed in a folder with the name that you specify. A copy of the test files stay in the Untitled Session folder until you run a new test or until you close the application.

Deskew channels

If skew is present between positive and negative channels, then the channels need to be deskewed before being used for waveform measurements. TekExpress DisplayPort 2.1 solution provides support for channel deskew using the following method:

1. Determine what the skew is for each channel.
2. From the TekScope menu, click **Vertical** and select **Deskew**.
3. In the Deskew/Attenuation window, click the channel (1 – 4) button for the first channel to be deskewed.
4. Click in the Ch(x) Deskew Time entry field and enter the skew. The skew can be +ve or –ve.
5. Click the channel button for the next channel and repeat step 4, above.
6. After entering the skew for all the channels that require it, from the Options menu in TekExpress DisplayPort 2.0, select **Deskew**.
7. In the Deskew dialog box, select the desired level:
   - Less than 100 mV signal amplitude: Select this if the signal amplitude is such that the oscilloscope's vertical setting is less than 100 mV/division.
   - 100 mV or greater signal amplitude: Select this if the signal amplitude is such that the oscilloscope's vertical setting is greater than 100 mV/division.
8. Click **Read Deskew/Attn.**
9. When finished, click **Close**.

Each input channel has its own deskew settings. Deskew compensates individual channels for probes or cables of different lengths. The instrument applies the delay values after each completed acquisition. The deskew values are saved as part of the instrument setup. The deskew values for the selected channel are retained until you change the probe, you restore a saved setup, or you recall the factory setup.

See Also

Pre-Run checklist (on page 22)

Appendix-A

Following are the compliance parameters for all DisplayPort 2.1 measurements

Compliance Parameters list for all DisplayPort 2.1 Signal Test measurements

Test Name	Test Point	Data Rate	Preset	Voltage Swing	SSC
▪ Preset Optimization Measurement UHBR10 TP2 ▪ Eye height testing UHBR10 TP2 ▪ Eye width testing UHBR10 TP2 ▪ Total Jitter (TJ) Measurement UHBR10 TP2 ▪ Random Jitter (RJ) Measurements UHBR10 TP2 ▪ UDJ Measurement UHBR10 TP2 ▪ LFUDJ Measurement UHBR10 TP2 ▪ DDJ Measurement UHBR10 TP2 ▪ UJ Measurement UHBR10 TP2 ▪ SSC Phase Deviation Measurement UHBR10 TP2 ▪ SSC Down Spread Rate Measurement UHBR10 TP2 ▪ SSC Down Spread Range Measurement UHBR10 TP2 ▪ SSC Slew Rate Measurement UHBR10 TP2 ▪ UI Measurement UHBR10 TP2 ▪ Bit Rate Measurement UHBR10 TP2 ▪ AC Common Mode Measurement UHBR10 TP2	TP2	UHBR10	▪ P0 ▪ P01 ▪ P02 ▪ P03 ▪ P04 ▪ P05 ▪ P06 ▪ P07 ▪ P08 ▪ P09 ▪ P10 ▪ P11 ▪ P12 ▪ P13 ▪ P14 ▪ P15	800 mV	▪ SSC Enabled ▪ SSC Disabled ▪ Both
▪ Preset Optimization Measurement UHBR10 TP3_EQ ▪ Eye height testing UHBR10 TP3_EQ ▪ Eye width testing UHBR10 TP3_EQ ▪ Total Jitter (TJ) Measurement UHBR10 TP3_EQ ▪ Random Jitter (RJ) Measurements UHBR10 TP3_EQ ▪ UDJ Measurement UHBR10 TP3_EQ ▪ LFUDJ Measurement UHBR10 TP3_EQ ▪ DDJ Measurement UHBR10 TP3_EQ ▪ UJ Measurement UHBR10 TP3_EQ	TP3_EQ				
▪ Preset Optimization Measurement UHBR13.5 TP2 ▪ Eye height testing UHBR13.5 TP2 ▪ Eye width testing UHBR13.5 TP2 ▪ Total Jitter (TJ) Measurement UHBR13.5 TP2 ▪ Random Jitter (RJ) Measurements UHBR13.5 TP2 ▪ UDJ Measurement UHBR13.5 TP2 ▪ LFUDJ Measurement UHBR13.5 TP2	TP2	UHBR13.5	▪ P0 ▪ P01 ▪ P02 ▪ P03 ▪ P04 ▪ P05 ▪ P06 ▪ P07 ▪ P08	800 mV	▪ SSC Enabled ▪ SSC Disabled ▪ Both

Test Name	Test Point	Data Rate	Preset	Voltage Swing	SSC
▪ DDJ Measurement UHBR13.5 TP2 ▪ UJ Measurement UHBR13.5 TP2 ▪ SSC Phase Deviation Measurement UHBR13.5 TP2 ▪ SSC Down Spread Rate Measurement UHBR13.5 TP2 ▪ SSC Down Spread Range Measurement UHBR13.5 TP2 ▪ SSC Slew Rate Measurement UHBR13.5 TP2 ▪ UI Measurement UHBR13.5 TP2 ▪ Bit Rate Measurement UHBR13.5 TP2 ▪ AC Common Mode Measurement UHBR13.5 TP2			▪ P09 ▪ P10 ▪ P11 ▪ P12 ▪ P13 ▪ P14 ▪ P15		
▪ Preset Optimization Measurement UHBR13.5 TP3_EQ ▪ Eye height testing UHBR13.5 TP3_EQ ▪ Eye width testing UHBR13.5 TP3_EQ ▪ Total Jitter (TJ) Measurement UHBR13.5 TP3_EQ ▪ Random Jitter (RJ) Measurements UHBR13.5 TP3_EQ ▪ UDJ Measurement UHBR13.5 TP3_EQ ▪ LFUDJ Measurement UHBR13.5 TP3_EQ ▪ DDJ Measurement UHBR13.5 TP3_EQ ▪ UJ Measurement UHBR13.5 TP3_EQ	TP3_EQ				
▪ Preset Optimization Measurement UHBR20 TP2 ▪ Eye height testing UHBR20 TP2 ▪ Eye width testing UHBR20 TP2 ▪ Total Jitter (TJ) Measurement UHBR20 TP2 ▪ Random Jitter (RJ) Measurements UHBR20 TP2 ▪ UDJ Measurement UHBR20 TP2 ▪ LFUDJ Measurement UHBR20 TP2 ▪ DDJ Measurement UHBR20 TP2 ▪ UJ Measurement UHBR20 TP2 ▪ SSC Phase Deviation Measurement UHBR20 TP2 ▪ SSC Down Spread Rate Measurement UHBR20 TP2 ▪ SSC Down Spread Range Measurement UHBR20 TP2 ▪ SSC Slew Rate Measurement UHBR20 TP2	TP2	UHBR20	▪ P0 ▪ P01 ▪ P02 ▪ P03 ▪ P04 ▪ P05 ▪ P06 ▪ P07 ▪ P08 ▪ P09 ▪ P10 ▪ P11 ▪ P12 ▪ P13 ▪ P14 ▪ P15	800 mV	▪ SSC Enabled ▪ SSC Disabled ▪ Both

Test Name	Test Point	Data Rate	Preset	Voltage Swing	SSC
▪ UI Measurement UHBR20 TP2 ▪ Bit Rate Measurement UHBR20 TP2 ▪ AC Common Mode Measurement UHBR20 TP2					
▪ Preset Optimization Measurement UHBR20 TP3_EQ ▪ Eye height testing UHBR20 TP3_EQ ▪ Eye width testing UHBR20 TP3_EQ ▪ Total Jitter (TJ) Measurement UHBR20 TP3_EQ ▪ Random Jitter (RJ) Measurements UHBR20 TP3_EQ ▪ UDJ Measurement UHBR20 TP3_EQ ▪ LFUDJ Measurement UHBR20 TP3_EQ ▪ DDJ Measurement UHBR20 TP3_EQ ▪ UJ Measurement UHBR20 TP3_EQ	TP3_EQ				

NOTE: If the DUT is capable of operating with SSC enabled or disabled, the DUT shall be tested with SSC enabled. If SSC is disabled, SSC tests should be skipped.

Compliance Parameters list for all DisplayPort 2.1 TX Equalization measurements

Test Name	Preset	Data Rate	Voltage Swing	SSC	Test Point
TXEQ Preset 0 UHBR10	P0	UHBR10	800 mV	▪ SSC Enabled ▪ SSC Disabled ▪ Both	TP2
TXEQ Preset 1 UHBR10	P1				
TXEQ Preset 2 UHBR10	P2				
TXEQ Preset 3 UHBR10	P3				
TXEQ Preset 4 UHBR10	P4				
TXEQ Preset 5 UHBR10	P5				
TXEQ Preset 6 UHBR10	P6				
TXEQ Preset 7 UHBR10	P7				
TXEQ Preset 8 UHBR10	P8				
TXEQ Preset 9 UHBR10	P9				
TXEQ Preset 10 UHBR10	P10				
TXEQ Preset 11 UHBR10	P11				
TXEQ Preset 12 UHBR10	P12				
TXEQ Preset 13 UHBR10	P13				
TXEQ Preset 14 UHBR10	P14				
TXEQ Preset 15 UHBR10	P15				

Test Name	Preset	Data Rate	Voltage Swing	SSC	Test Point
TXEQ Preset 0 UHBR13.5	P0	UHBR13.5	800 mV	▪ SSC Enabled ▪ SSC Disabled ▪ Both	TP2
TXEQ Preset 1 UHBR13.5	P1				
TXEQ Preset 2 UHBR13.5	P2				
TXEQ Preset 3 UHBR13.5	P3				
TXEQ Preset 4 UHBR13.5	P4				
TXEQ Preset 5 UHBR13.5	P5				
TXEQ Preset 6 UHBR13.5	P6				
TXEQ Preset 7 UHBR13.5	P7				
TXEQ Preset 8 UHBR13.5	P8				
TXEQ Preset 9 UHBR13.5	P9				
TXEQ Preset 10 UHBR13.5	P10				
TXEQ Preset 11 UHBR13.5	P11				
TXEQ Preset 12 UHBR13.5	P12				
TXEQ Preset 13 UHBR13.5	P13				
TXEQ Preset 14 UHBR13.5	P14				
TXEQ Preset 15 UHBR13.5	P15				

Test Name	Preset	Data Rate	Voltage Swing	SSC	Test Point
TXEQ Preset 0 UHBR20	P0	UHBR20	800 mV	▪ SSC Enabled ▪ SSC Disabled ▪ Both	TP2
TXEQ Preset 1 UHBR20	P1				
TXEQ Preset 2 UHBR20	P2				
TXEQ Preset 3 UHBR20	P3				
TXEQ Preset 4 UHBR20	P4				
TXEQ Preset 5 UHBR20	P5				
TXEQ Preset 6 UHBR20	P6				
TXEQ Preset 7 UHBR20	P7				
TXEQ Preset 8 UHBR20	P8				
TXEQ Preset 9 UHBR20	P9				
TXEQ Preset 10 UHBR20	P10				
TXEQ Preset 11 UHBR20	P11				
TXEQ Preset 12 UHBR20	P12				
TXEQ Preset 13 UHBR20	P13				
TXEQ Preset 14 UHBR20	P14				
TXEQ Preset 15 UHBR20	P15				

NOTE: If the DUT is capable of operating with SSC enabled or disabled, the DUT shall be tested with SSC enabled.