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TekExpress DisplayPort 2.0 Automated Solution

Printable Application Help

077-1708-00

TekExpress DisplayPort 2.0 Automated Solution

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Tektronix, Inc.

14150 SW Karl Braun Drive

P.O. Box 500

Beaverton, OR 97077

USA

For product information, sales, service, and technical support:

- In North America, call 1-800-833-9200.
- Worldwide, visit *www.tek.com* to find contacts in your area.

Welcome

The TekExpress DisplayPort 2.0 software supports specification 2.0 and performs the pre-compliance tests. It uses DPOJET (Jitter and Eye Analysis tool), CIO plug-in, SDLA (Serial Data Link Layer Analysis), and DisplayPort Essential (DisplayPort measurement library) to perform the pre-compliance tests. These tools are offered by Tektronix for characterization/debug tests and compliance tests of the silicon.

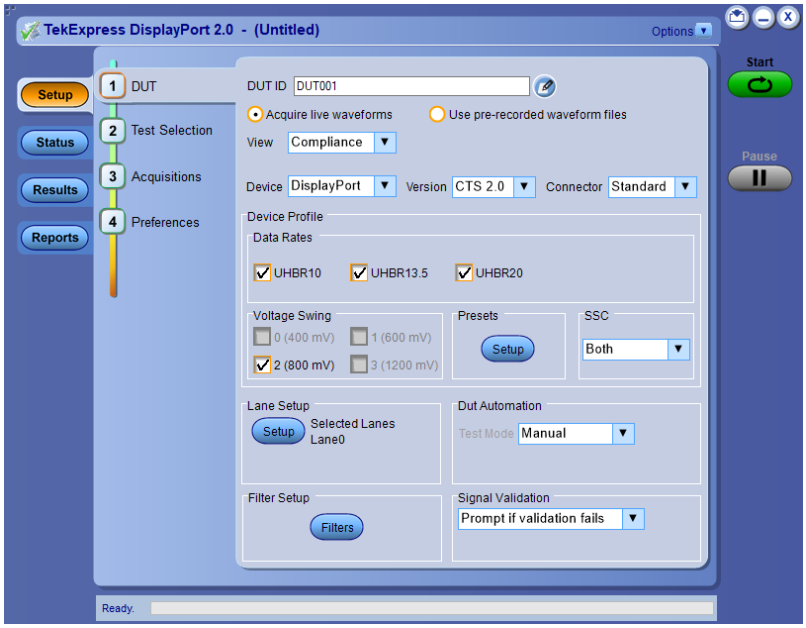


Figure 1: Setup panel with compliance view

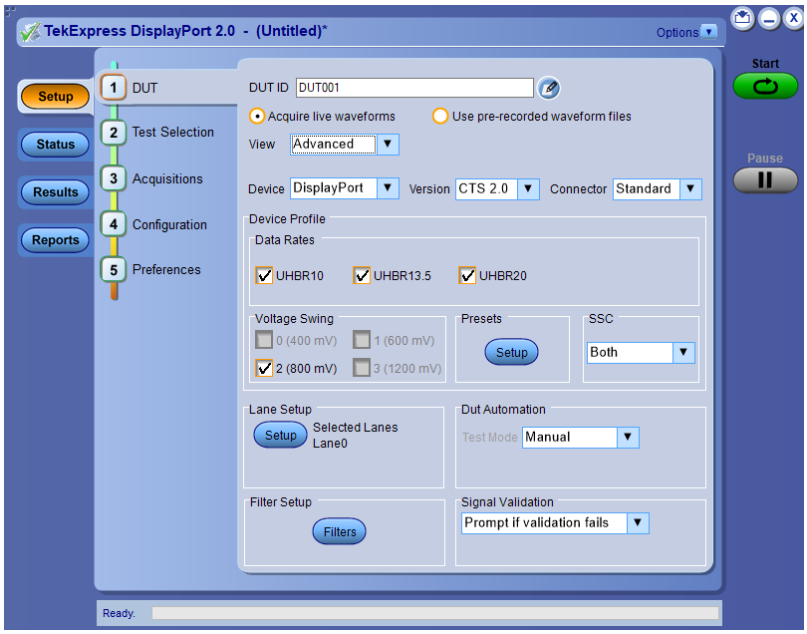


Figure 2: Setup panel with advanced view

Key features

- Complete pre-compliance testing of data rates UHBR10, UHBR13.5, and UHBR20 for DP2.0 Source devices (Standard and Type-C connectors)
- Supports P0 to P15 presets for signal test
- Supports both TP2 and TP3 EQ test point testing. Use SDLA for TP3 EQ test point analysis.
- Optimized algorithms to execute tests with improved accuracy
- Supports measurements that are not supported in CTS (SSC measurements, Unit Interval Measurements, LFUDJ Measurements)
- Support P7625 and P7633 differential probes
- Fixture De-embedding in differential and single-ended mode by creating a custom filter file using SDLA software to leverage the channel modeling and receiver equalization functionality.
- Selective testing:
  - Selection of specific or all data rates.
  - Selection of tests individually or in groups.
  - Selection of specific presets for individual measurements.
  - Selection of SSC On, Off, or Both.
- Quick testing:
  - Support for using saved setup for testing. Avoids overhead of doing the setup for every run.
  - Support multi-lane testing on one go.
  - Analyze multiple data rates and multiple presets on one go.
  - Analyze TP2 and TP3 EQ test points on one go.
  - One-click selection of multiple tests ensures faster testing.
  - One-click report format change
- Avoids repeated testing through accurate and reliable results from a single run
- Supports multi-run feature for test repetition with the same setup
- Supports signal validation option to detect anomalies in the signal before analysis
- Supports offline analysis of the saved waveforms in Pre-Recorded mode
- Detailed test reporting:
  - Exports available in .mht, .pdf and .csv formats for advanced data analysis
  - Provides a Pass/Fail summary table
  - Provides pre-compliance report
  - Provides limits and margin details on each test
  - Provides all results, grouped by features
  - Provides a consolidated report for all tests
- DisplayPort 2.0 DPOJET plug-in solution provides the MOI and setup files for debugging and characterization.

Table of Contents

Welcome.....5
Key features.....6
Getting help and support.....10
Product documents.....10
Conventions.....10
Technical support.....11
Getting started.....12
Hardware requirements.....12
Compatibility.....12
Minimum system requirements.....12
Supported probes.....13
Software requirements.....13
Downloading and installing the software.....13
Activate the license.....14
View software version and license key details.....14
Setting up the test environment.....15
About setting up tests.....15
Equipment connection setup.....16
Individual test configuration.....18
About running tests.....18
Before you click start.....18
Pre-Run checklist.....20
Run a test in pre-recorded mode.....20
Launching the application.....22
Application controls.....23
Options menu functions.....25
Configure email settings.....26
TekExpress instrument control settings.....27
Setup panel: Configure the test setup.....28
DUT: Set DUT settings.....29
Test Selection: Select the tests.....33
Acquisitions: Set waveform acquisition settings.....34
Set acquisition tab parameters.....35
Use pre-recorded waveforms for analysis.....35
Running measurements using pre-recorded waveforms.....36
Acquire live waveforms for analysis.....37
Configuration: Set measurement limits for tests.....39
Preferences: Set the test run preferences.....42
Status panel: View the test execution status.....43
View test execution status.....43
View test execution logs.....44
Results panel: View summary of test results.....46
Filter the test results.....46
Reports panel: Configure report generation settings.....47

Select report generation options....47
View a generated report....50
Saving and recalling test setup....52
Test setup files overview....52
Save the configured test setup....52
Load a saved test setup....52
Select a pre-run session from the loaded test setup....52
Save the test setup with a different name....53
SCPI Commands....54
About SCPI command....54
Socket configuration for SCPI commands....54
Set or query the device name of application....60
Set or query the DUTID of application....61
Set or query the suite name of the application....61
Set or query the test name of the application....61
Set or query the version name of the application....62
Set or query the general parameter values....63
Set or query the acquire parameter values....67
Set or query the analyze parameter values....68
Query the available devices in the DUT panel of the application....68
Query the available suites for the selected device....68
Query the list of available tests of the application....70
Query the avaliable version names of the application....71
Query the list of available instruments based on the specified instrument type....72
Set or query the IP address of the instrument based on the specified instrument type....72
Query the information of the generated report file....72
Query the information of the generated waveform files....73
Query the information of the generated image files....73
Query the active TekExpress application name....74
Sets or query the acquire mode status....74
Set or query the execution mode status....74
Generate the report for the current session....75
Query the value of specified report header field in the report....75
Query the value of specified result detail available in report summary/details table....76
Restore the setup to default settings....76
Save the settings to a specified session....77
Open the setup from a specified session....77
Query the current setup file name....77
Run/stop/pause/resume the selected measurements execution in the application....77
Query the current measurement execution status....78
Query whether the current setup is saved or not saved....78
Query the status of the previous command execution....78
Query the last error occurred....79
Set or query the popup details....79
Set or query the View report after generating option status....80
Set or query the enable/disable status of Verbose function....80
Set or query the waveform file recalled for the specified test name and acquire type....81
Sets or query the limit values in the limits editor window....81
Exit or close the application....82

Example....83
References....87
Application directories....87
File name extensions....88
View test-related files....88
Deskew channels....89
Appendix-A....90
Index....92

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.

Table 1: TekExpress Application documents

To learn about	Use this document
How to use the application How to remotely control the instrument	TekExpress <Application Name> Help PDF version of this document can be downloaded from *www.tek.com/downloads* Compiled HTML (CHM) version is integrated with the application. Press **F1** key from the keyboard to launch the help. Tektronix Part Number: 077-xxxx-xx

Conventions

This application help uses the following conventions:

- The term "Application," and "Software" refers to the TekExpress Application.
- 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.

Table 2: 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 your application or oscilloscope. Contact Tektronix through mail, telephone, or the Web site. See *Contacting Tektronix* 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 2.0 application runs on the following Tektronix oscilloscopes:

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

See Also

Minimum system requirements

Minimum system requirements

The following table describes the minimum system requirements for the TekExpress Displayport 2.0 application.

Table 3: System requirements

Resources	Supported models
Oscilloscope	DPO70000DX/SX series oscilloscopes with bandwidth ≥ 21 GHz for UHBR data rates in compliance mode. Refer*Compatibility* for list of compatible oscilloscopes.
Processor	Same as the oscilloscope
Operating System	Same as the oscilloscope (Win 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, v10.3.0 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 v3.0.11.10 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, P76CA-SMP, and P76TA
Other Devices	• Microsoft compatible mouse or compatible pointing device • Four USB ports (two USB ports minimum)

Table continued…

Resources	Supported models
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

Supported probes

The table provides the list of probes recommended for the DisplayPort 2.0 application.

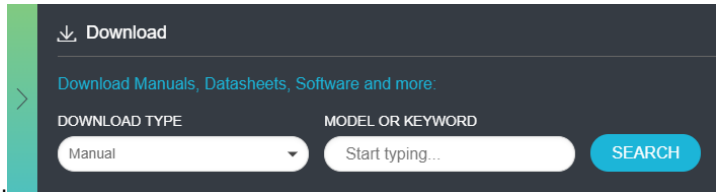
Recommended Probe model
7625,7633 differential probe based input, which offers the most efficient test configuration, by offering inputs for all 4 differential DisplayPort signals concurrently. This configuration precludes the testing of common mode and skew measurements..
TCA-based single-ended input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

Software requirements

Downloading and installing the software

Complete the following steps to download and install the latest TekExpress <Application Name> 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 <Application Name>`.
5. Select **Application > TekExpress <Application Name>** from the Oscilloscope menu, to open the application.

Activate the license

Activate the license using the **Option Installation** wizard in the TekScope application:

1. In the **TekScope** application menu bar, click **Utilities** > **Option Installation**. The TekScope Option Installation wizard opens.
2. Push the **F1** key on the oscilloscope keyboard to open the Option Installation help topic.
3. Follow the directions in the help topic to activate the license.

View software version and license key details

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 28. 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) 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.
- Data Dependent Jitter (DDJ) Measurement - DDJ is threshold-crossing time deviations correlated to the previous bits on the current data bit.
- Random Jitter (RJ) Measurement - Random Jitter (RJ) is also called Gaussian jitter, is unpredictable electronic timing noise. Random jitter typically follows a normal distribution.
- 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.
- 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.
- 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.
- Low Frequency Uncorrelated Deterministic Jitter (LFUDJ)Measurement - Low Frequency UDJ measurement calculates deterministic jitter after removal of data dependent jitter on low frequency signal.
- SSC Down Spread Rate Measurement - SSC Down Spread measurement calculates computes the SSC modulating frequency.
- SSC Phase Deviation Measurement - This measurement calculates SSC phase deviation in Seconds, measured at each inflection point in the modulation profile.
- 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.
- 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.

See Also

Before you click start

Deskew channels

About running tests

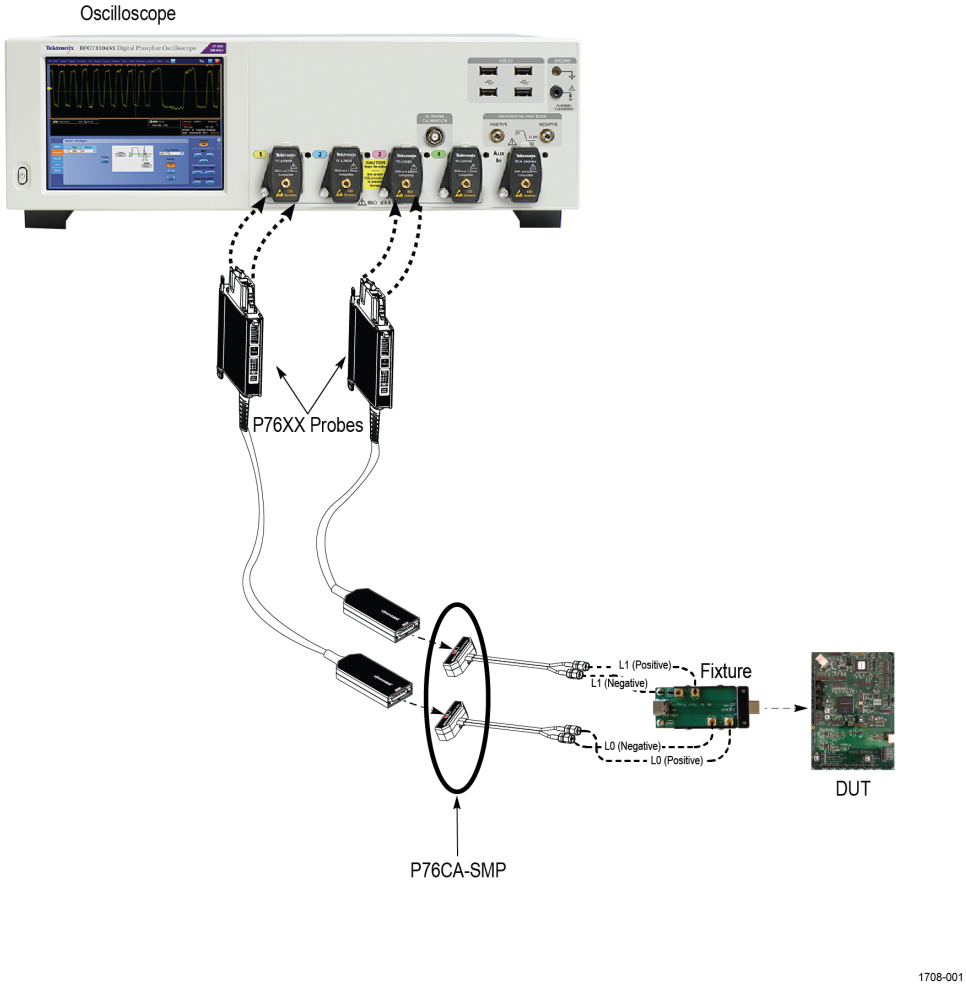
Equipment connection setup

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

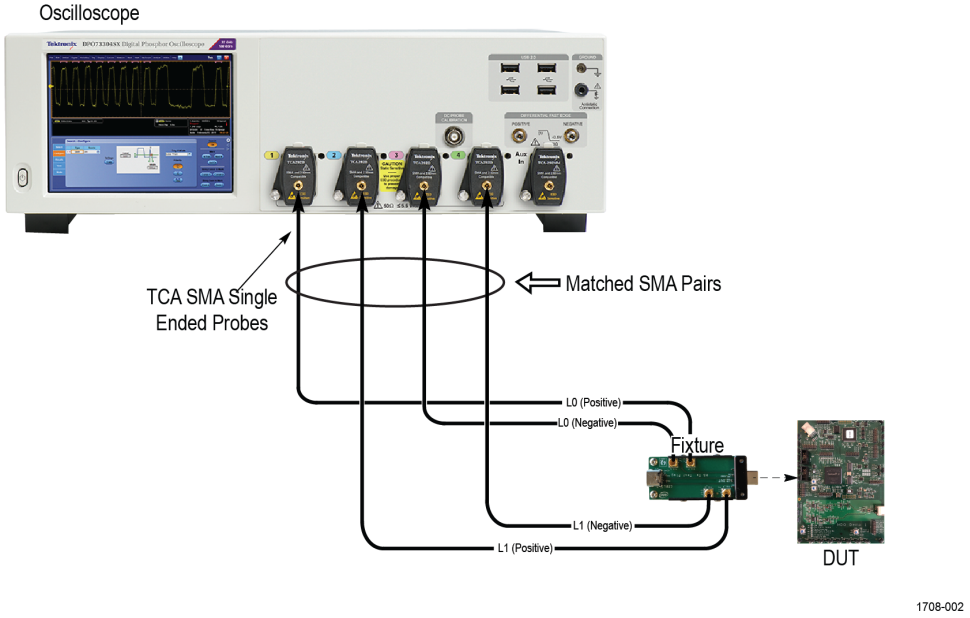
- A *supported Tektronix oscilloscope*
- TCA-SMA or Differential Probes (for example, P7625)
- The device under test
- Test fixtures

The following diagrams show different setups.

DisplayPort 2.0 setup with Differential/Tri-Mode Probe



DisplayPort 2.0 setup with single ended TCA SMA



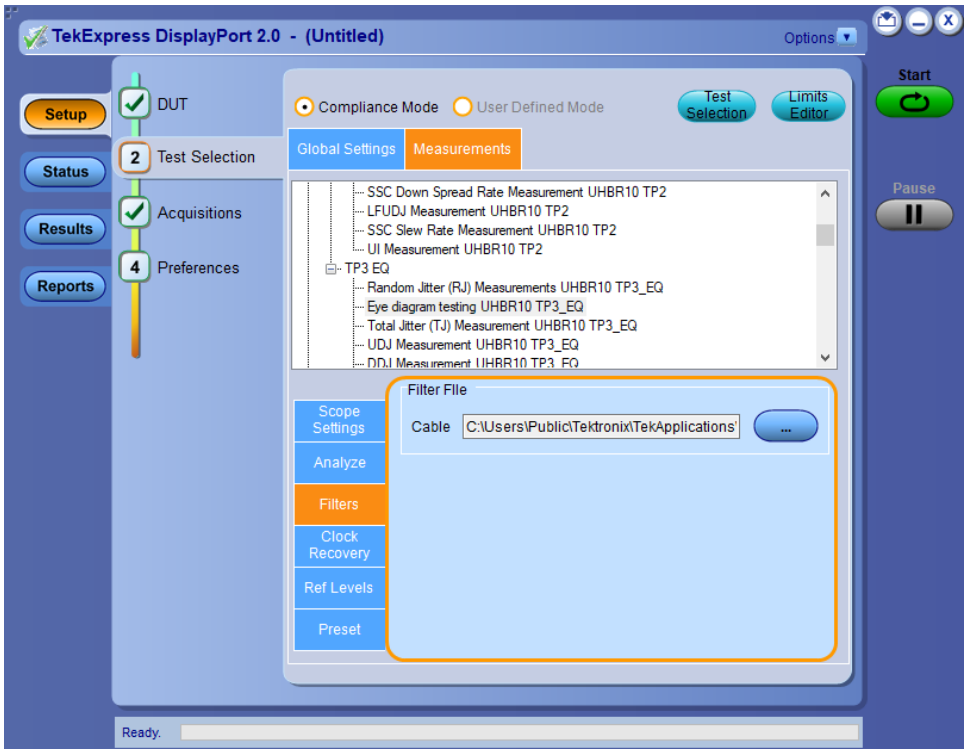
See Also

About setting up tests

Pre-Run checklist

Deskew channels

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* 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 2.0 application on top, select **Keep On Top** from the DisplayPort 2.0 application *Options menu*.

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

See Also

Before you click start

About configuring tests

About setting up tests

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 2.0, it creates the following folders on the oscilloscope:

- Windows 10: `C:\Program Files\Tektronix\TekExpress\` **TekExpress DisplayPortTx 2.0**
- `\My Documents\My TekExpress\` **DisplayPort 2.0**
- `\My Documents\My TekExpress\DisplayPort 2.0\` **Untitled Session**

Every time you launch TekExpress DisplayPort 2.0, an `Untitled Session` folder is created in the `DisplayPort 2.0` folder. The `Untitled Session` folder is automatically deleted when you exit the `DisplayPort 2.0` 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.

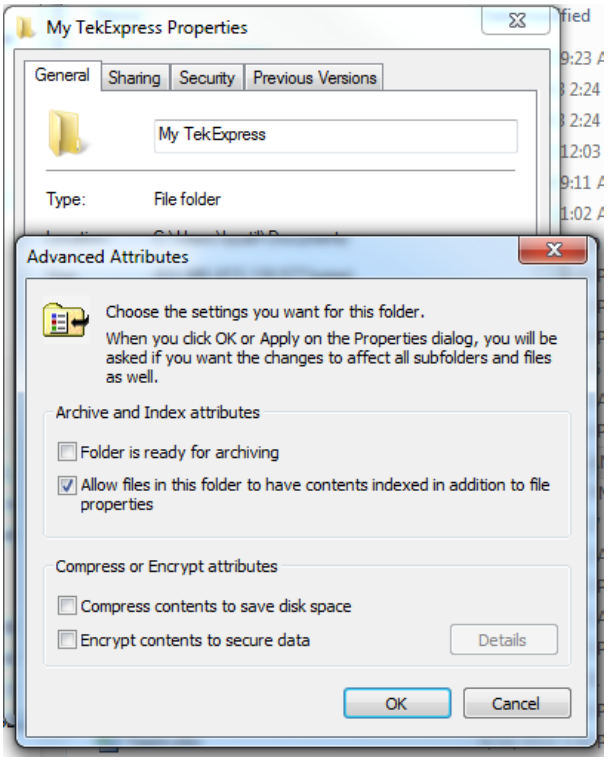
   The `My TekExpress` folder has the share name format <domain><user ID>My TekExpress. Or, if the instrument is not connected to a domain, then the share name format is `<instrument name><user ID> My TekExpress`. This shared folder is used to save the waveform files and is used during other file transfer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

   a. Right-click the folder and select **Properties**.
   b. Select the **General** tab and then click **Advanced**.
   c. 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* before you run a test.

See Also

View test-related files on page 88

Application directories on page 87

File name extensions on page 88

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*.

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*.
4. Make sure that the application is able to find the oscilloscope. If it cannot, Refer *TekExpress instrument control settings* on page 27 to search for connected instruments.
   a. Launch the DisplayPort 2.0 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

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. Open the*Save the configured test setup* on page 52.
2. 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.
3. Select the **Acquisitions** tab.
4. In the *Set acquisition tab parameters* on page 35, look in the Waveform FileName column.
5. If no waveform files are listed, click the ellipsis button ( ) and then locate and select the desired waveform files. Skip to step 7.
6. 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.
7. Click **Start** to run the test.

See Also

Before you click start on page 18

Set acquisition tab parameters on page 35

Launching the application

To launch the TekExpress , DisplayPort 2.0 select from the oscilloscope menu bar.**Applications > TekExpress DisplayPort 2.0**

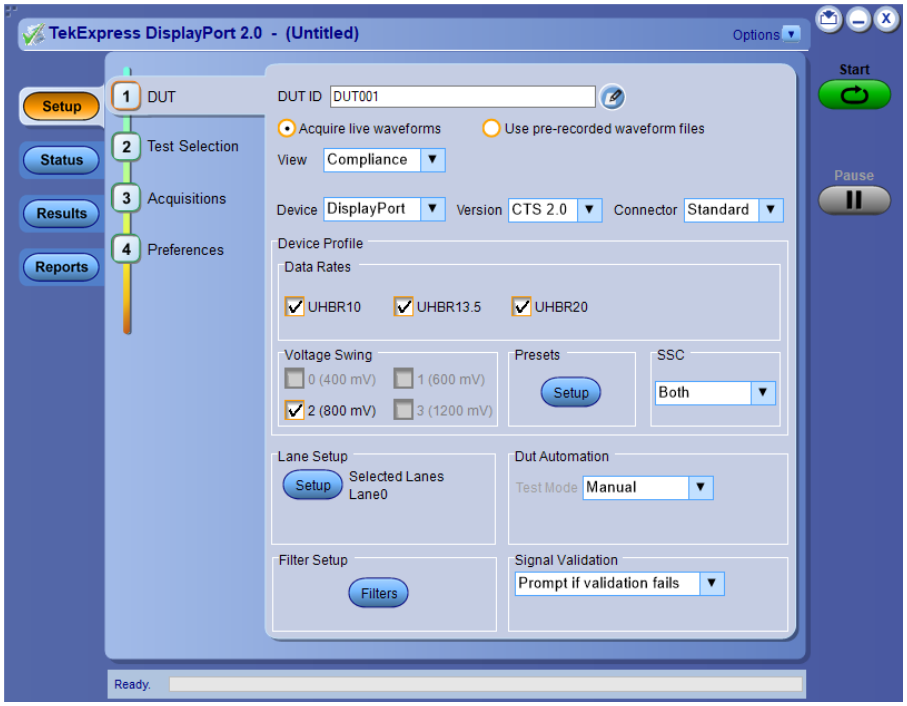


Figure 3: Setup panel with compliance view

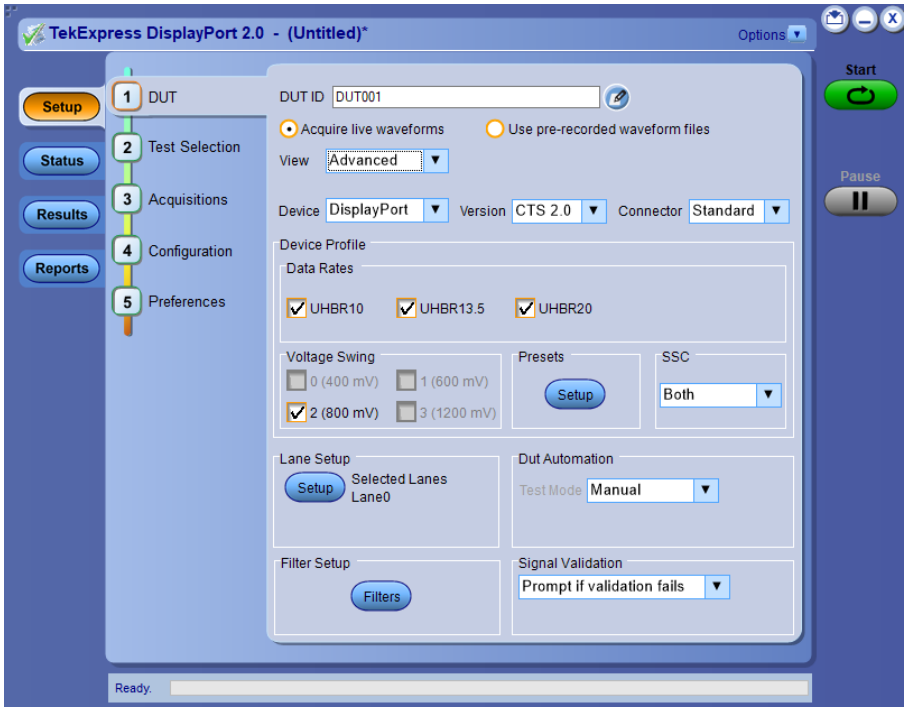


Figure 4: Setup panel with advanced view

During launch, a "My TekExpress" folder is created in the Documents folder of the current user and gets mapped to "X" drive. When the application is closed properly, the "X" drive gets unmapped. Session files are then stored inside the folder. If this file is not found, the application runs an instrument discovery program to detect connected instruments before launching TekExpress DisplayPort 2.0.

To keep the TekExpress DisplayPort 2.0 application on top of any application, select **Keep On Top** from the *options menu*. If the application goes behind the oscilloscope application, select **Applications > TekExpress DisplayPort 2.0** to bring the application to the front.

Application controls

This section describes the application controls.

Table 4: Application control description

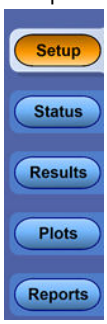
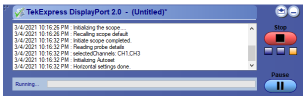
Item	Description
Options menu 	Menu to display global application controls.
Test panel 	Controls that open tabs for configuring test settings and options.
Start / Stop button  	Use the **Start** button to start the test run of the measurements in the selected order. If prior acquired measurements are 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 46. **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

Table continued…

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

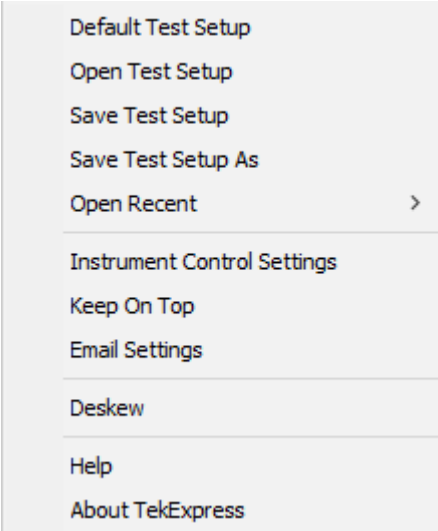


Table 5: Options menu settings

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	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 TekExpress application on top of all the applications.
Email Settings	Configures email options for test run and result notifications.
Deskew	Loads oscilloscope channel deskew settings into the application.
Help	Displays the TekExpress 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:

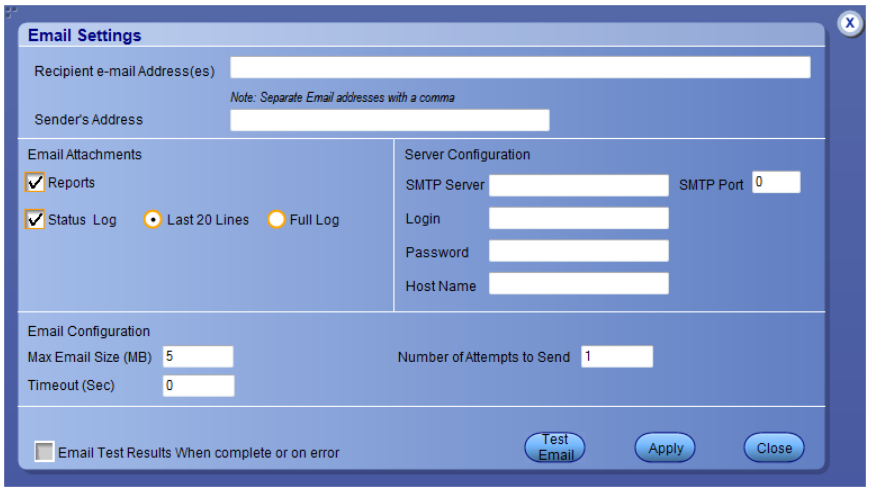


Figure 5: Email Settings

1. From the Options menu, select **Email Settings** to open the email settings dialog box.
2. (Required) For Recipient email Address(es), enter your email address. 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 used. For example: DPO72004C_B130099@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, select as desired:
   - Select the message file format to send: HTML (the default) or plain text.
   - 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.
   - To limit the number of attempts the system makes to send a notification, enter the number in the Number of Attempts to Send field. The default is 1. You can also specify a timeout.
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** to exit the Email Settings dialog box.

See Also

Configuration: Set measurement limits for tests on page 39

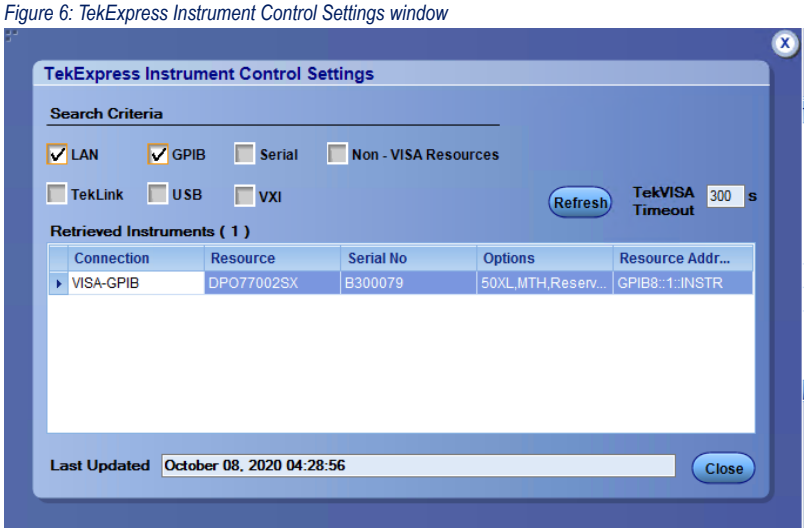
Preferences: Set the test run preferences on page 42

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 **USB** and **LAN** 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.

Figure 6: TekExpress Instrument Control Settings window



See also

Options menu functions on page 25

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.

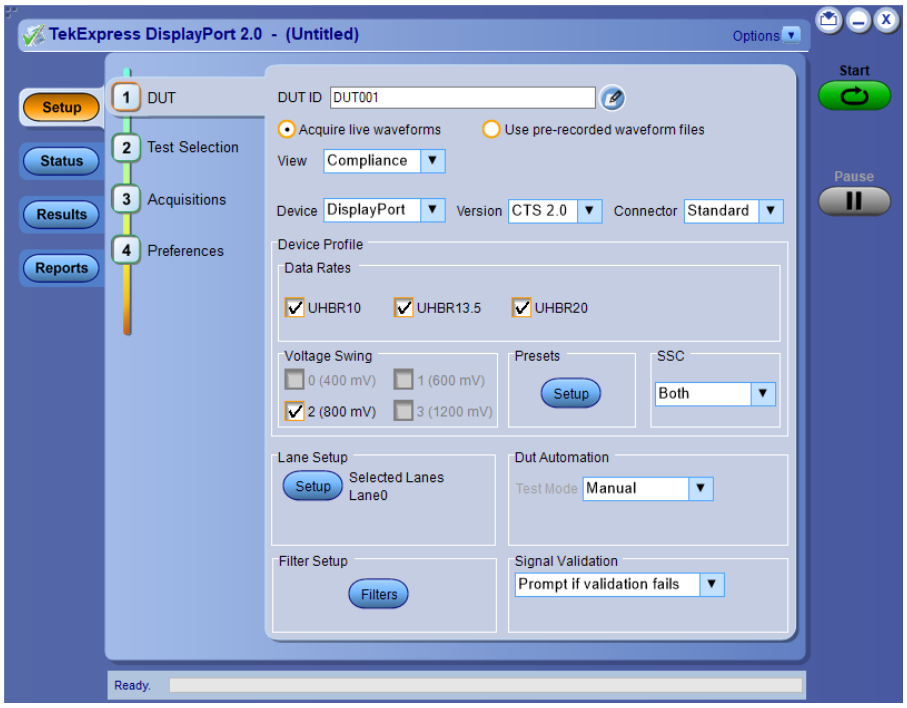


Figure 7: Setup panel with compliance view

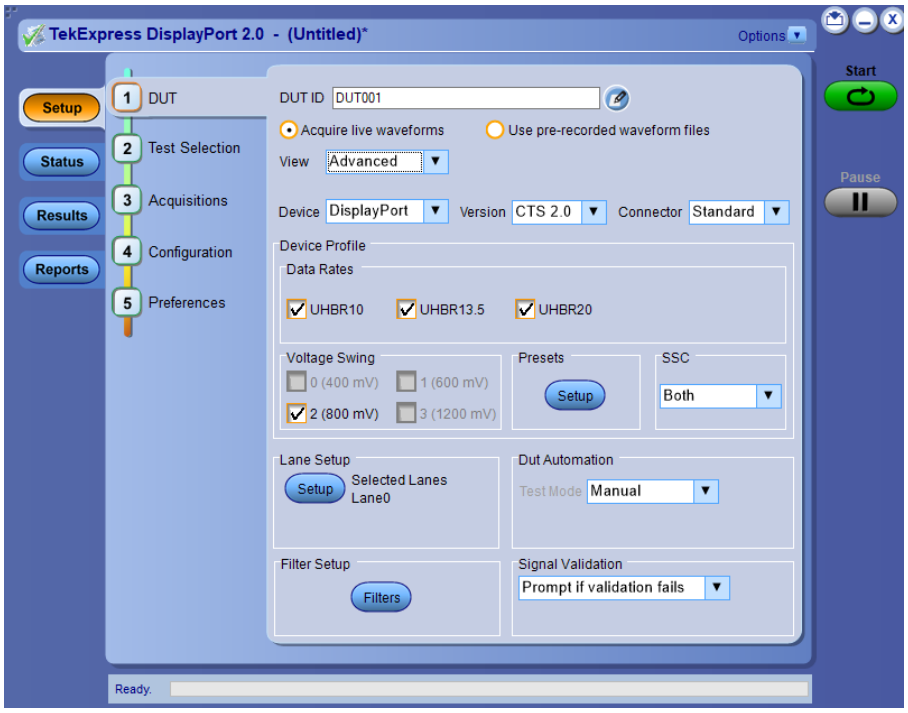


Figure 8: Setup panel with advanced view

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

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.

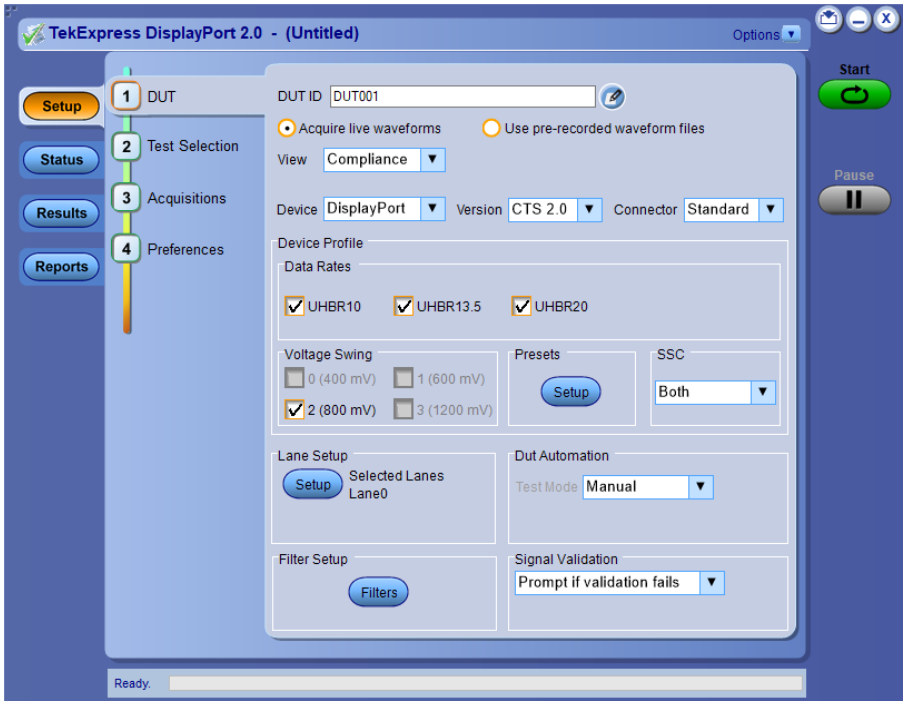


Figure 9: Setup panel with compliance view

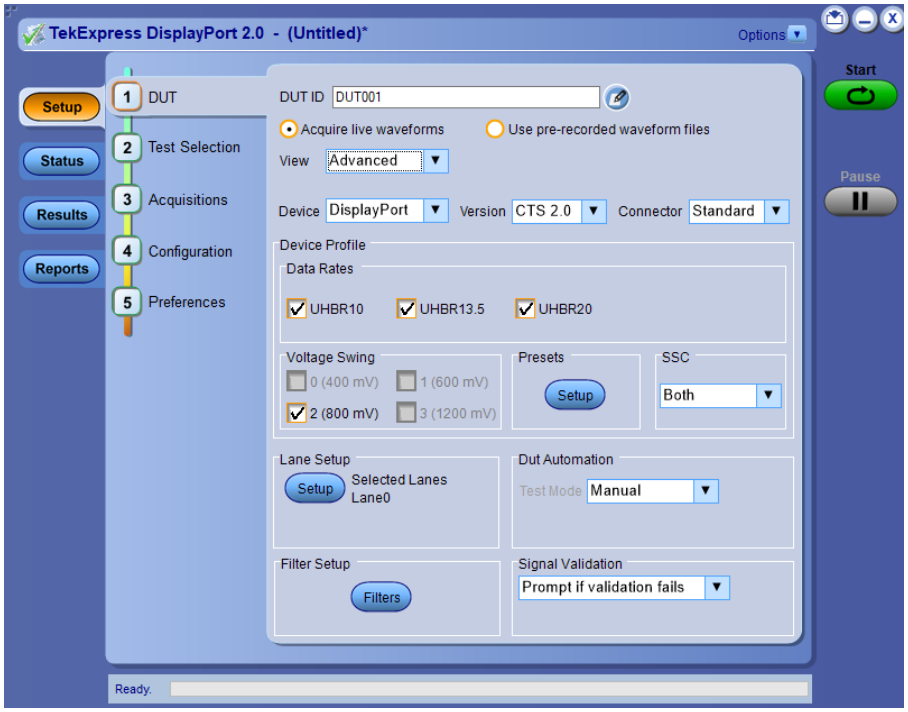


Figure 10: Setup panel with advanced view

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

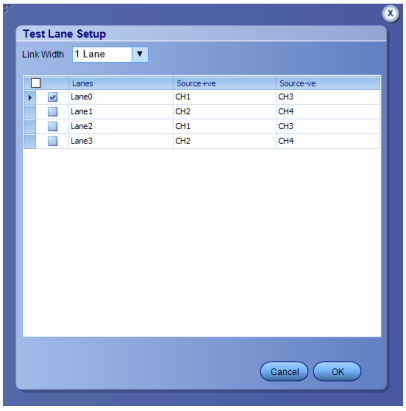
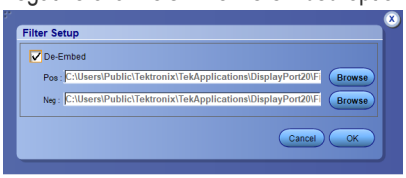
Table 6: DUT tab settings

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.
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.

Table continued…

Setting	Description
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 2.0 application supports only CTS 2.0 version.
Connector	Set the type of connector used for the test from the drop-down: • Standard • Type C
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 2.0. **Note:** 400 mV, 600 mV, and 1200 mV settings are not available.
Presets	Sixteen presets (P0 to P15) are supported for signal test for each data rate. Click **Setup** to view the set of presets. For each data rate there are individual tabs for the preset selection.  **Select All**: Selects all the presets for current data rate tab. **Deselect All**: Deselects all the presets for current data rate tab. **Cancel**: Undo the changes and close the pop-up. **OK**: Save the changes and close the pop-up.
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.

Table continued…

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. 
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	DUT toggle automation is set to manual to configure the DUT manually during the test.
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 33

About setting up tests on page 15

Use pre-recorded waveforms for analysis on page 35

Acquire live waveforms for analysis on page 37

Test Selection: Select the tests

Use the **Test Selection** tab to select **DisplayPort 2.0** tests. Listed tests depend on settings in the DUT tab.

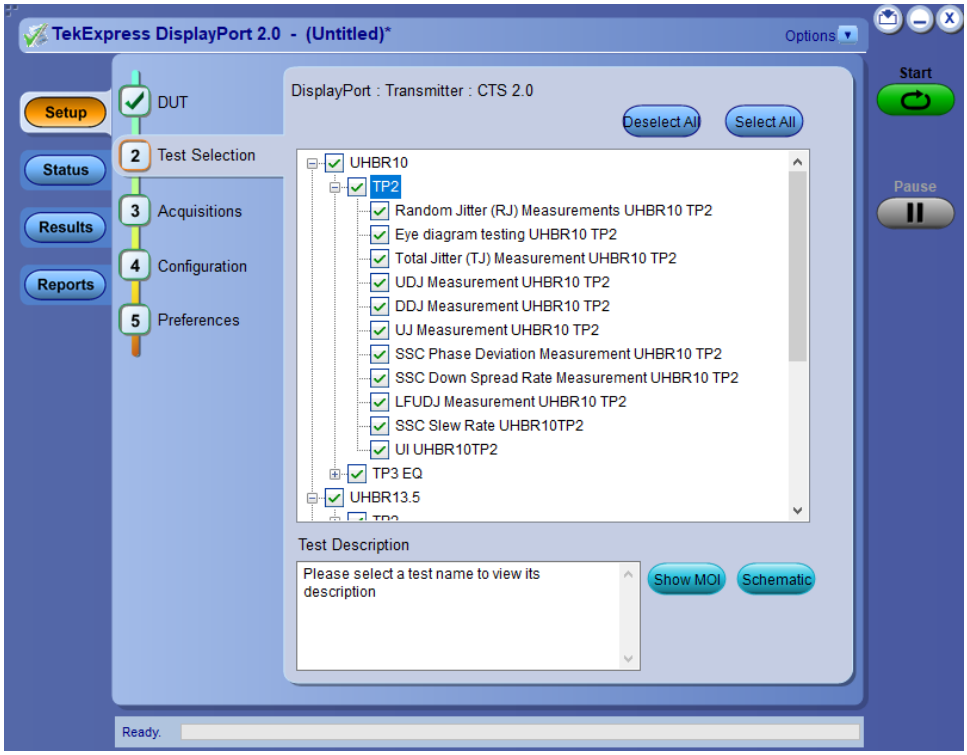


Table 7: Test Selection tab settings

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 35

About setting up tests on page 15

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.

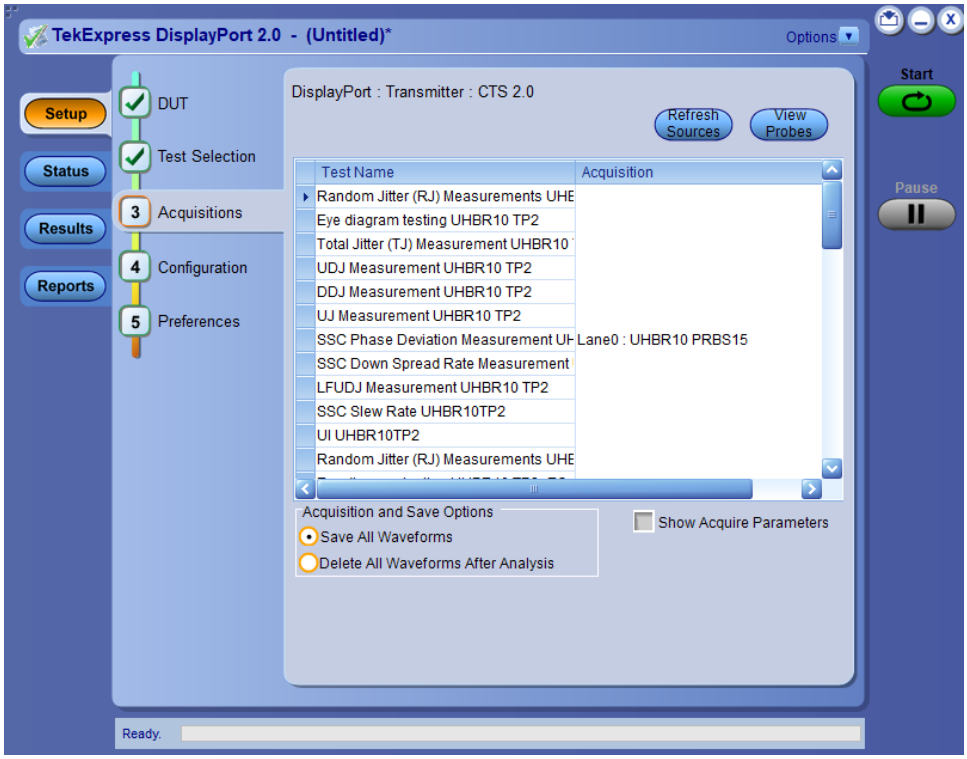


Table 8: Acquisition tab settings

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.
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 2.0 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 34 to select any other desired acquisition options.

See Also

Configuration: Set measurement limits for tests on page 39

About setting up tests

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* 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* 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*, and then click **Start**.

See Also

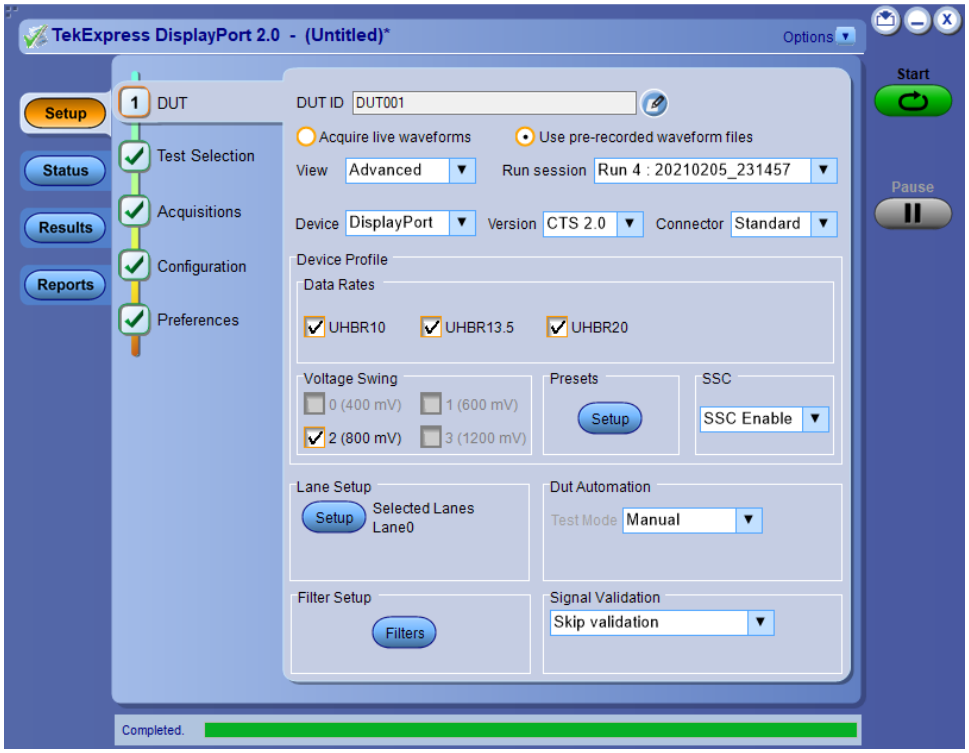
Before you click start

Pre-Run checklist

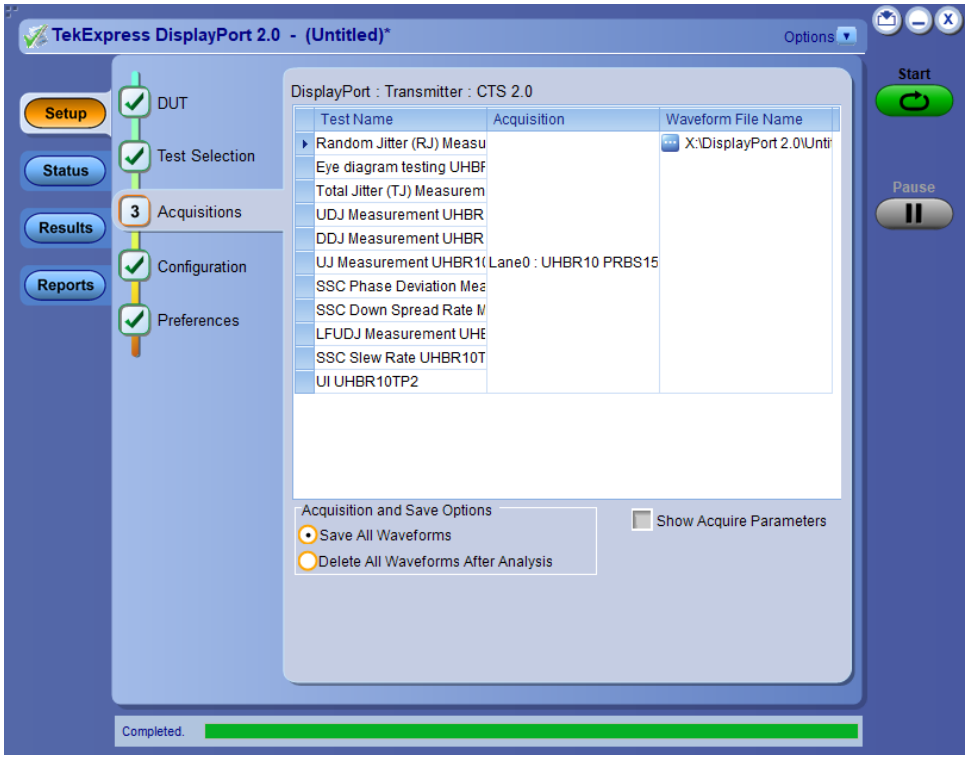
Set acquisition tab parameters on page 35

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 to *Waveform naming convention*.
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.

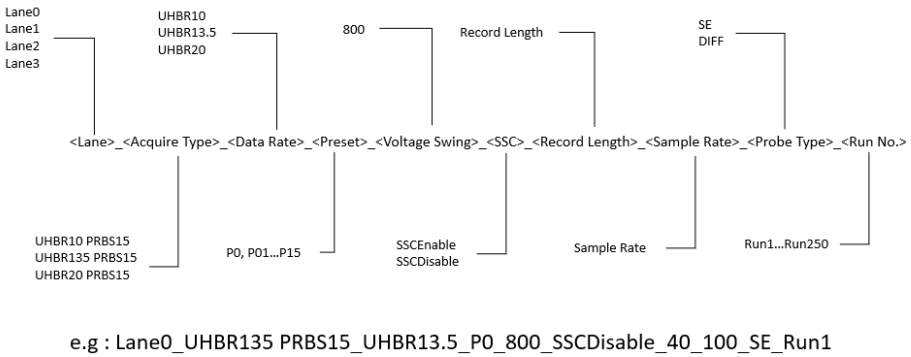


Figure 11: Waveform naming convention

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* on page 52 or *Saving and recalling test setup* on page 52.
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* as desired.
4. In the Test Selection tab, *select the desired test(s)*.

5. In the Acquisitions tab, do any of the following that apply:
   - Select the data sources for the lanes.
   - Select other desired *acquisitions parameters*.
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 35

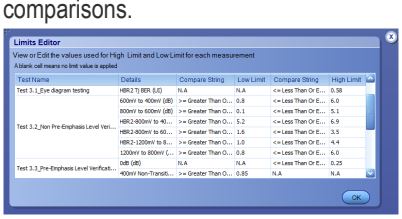
Configuration: Set measurement limits for tests on page 39

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.

Table 9: Configuration tab: Common parameters

Settings	Description
Limits Editor	Displays the upper and lower limits for the applicable measurement using different types of comparisons. 

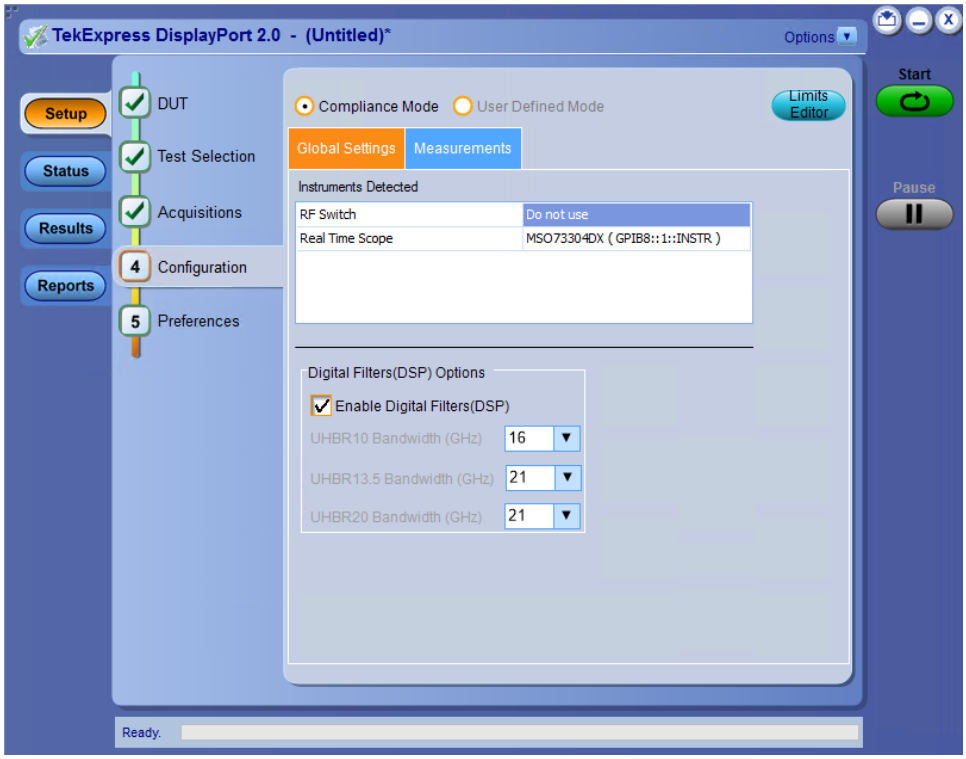


Figure 12: Configuration tab: Global settings

Table 10: 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 2.0 application.
Digital Filter (DSP) Options	
Enable Digital Filters (DSP)	Allows you to restrict the bandwidth of the instrument (70 GHz).

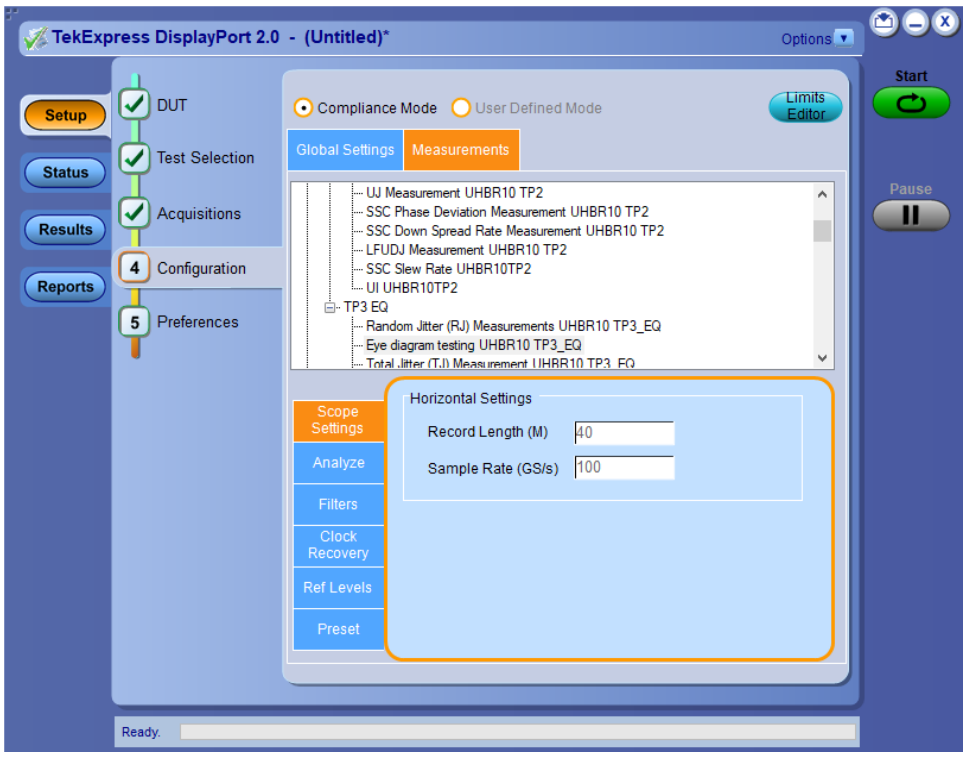


Figure 13: Configuration tab: Measurement settings

Table 11: 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	

Table continued…

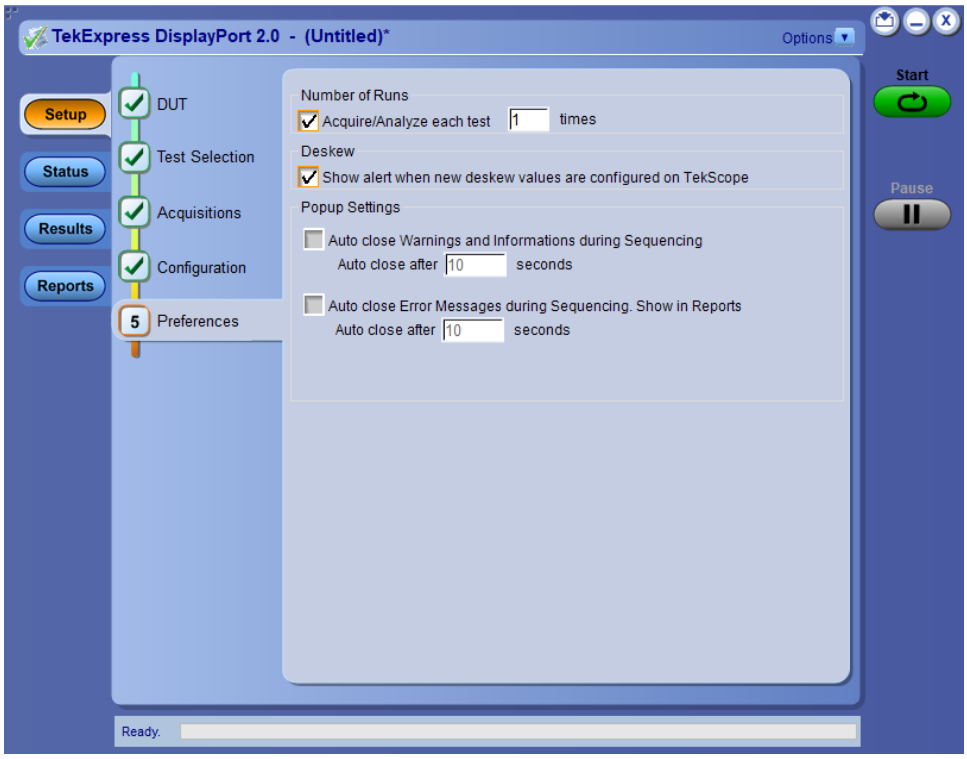
Settings	Description
Mask file path	Specifies the file which contains mask information.
Clock recovery	
Clock recovery method	Specifies the algorithm to use to recover the clock
PLL model	Defines the order of PLL
Damping (m)	Second parameter used for TYPE-II PLL
Loop BW (MHz)	Loop bandwidth is the Bandwidth 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.
Mide 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
Preset	Preset is defined as a Pair of Pre-shoot and De-emphasis values.

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.

Figure 14: Preferences tab



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

Table 12: Preferences tab settings

Setting	Description
Number of Runs	
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	
Show alert when new deskew values are configured on TekScope Actions on Test Measurement Failure	
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.

The **Test Status** tab presents a collapsible table with information about each test as it is running. Use the symbols to expand (+) and collapse (−) the table rows.

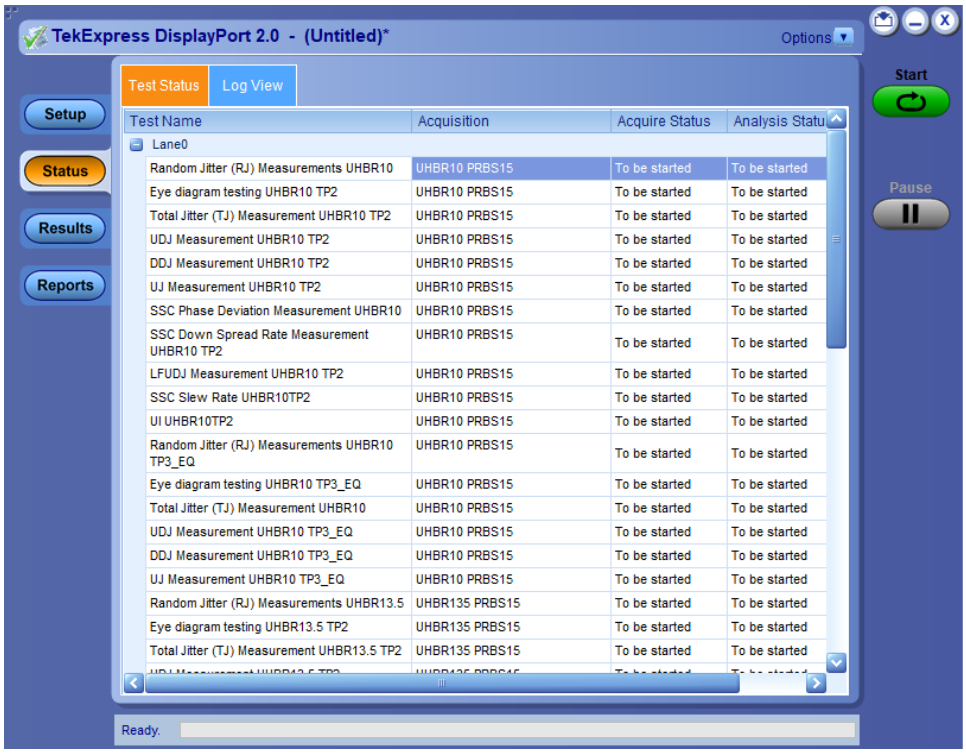


Figure 15: Test execution status view in Status panel

Table 13: Test execution status table headers

Table Header	Description
Test Name	Displays the measurement name.
Acquisition	Describes the type of data being acquired.

Table continued…

Table Header	Description
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.

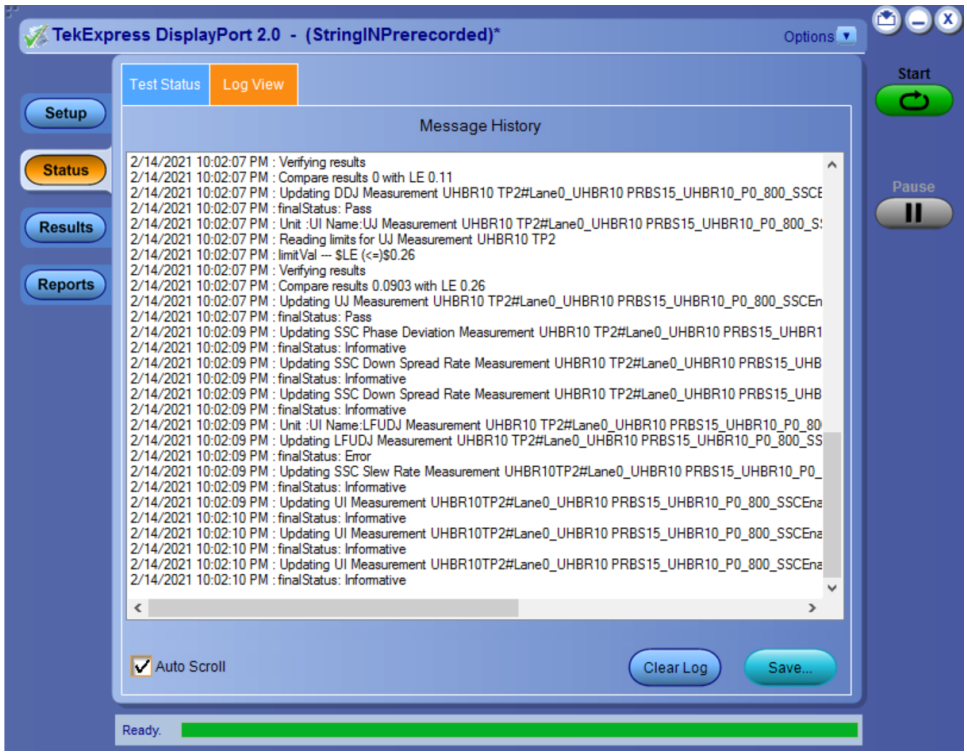


Figure 16: Log view in Status panel

Table 14: Status panel settings

Control	Description
Message History	Lists all the executed test operations and timestamp information.

Table continued…

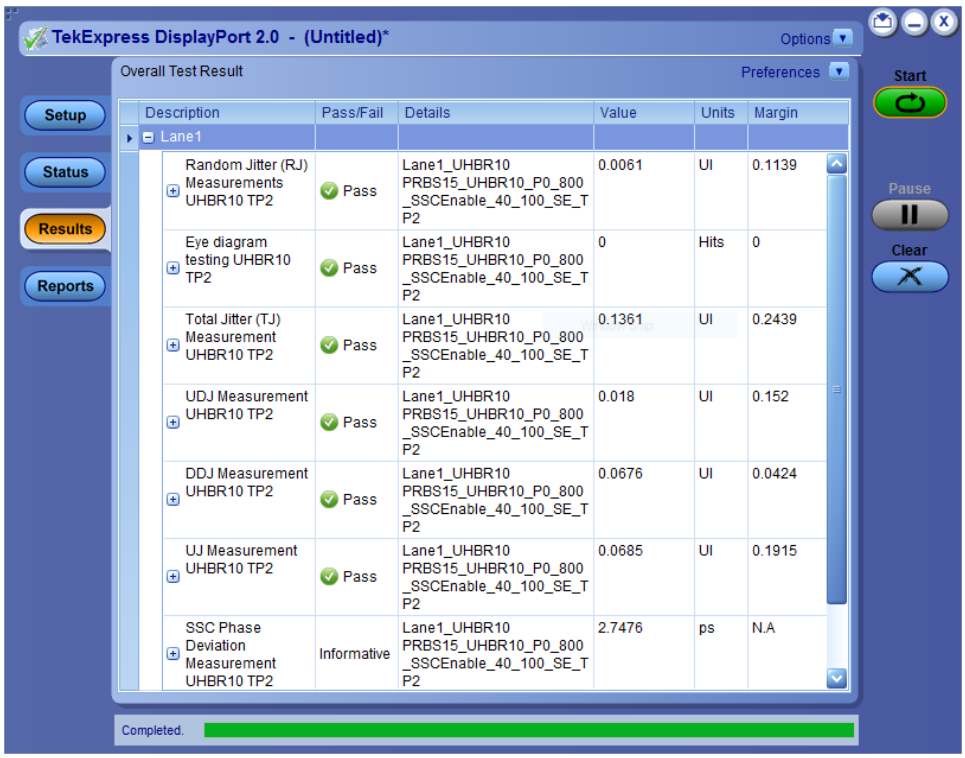
Control	Description
Auto Scroll	Enables automatic scrolling of the log view as information is added to the log during the test execution.
Clear Log	Clears all the messages from the log view.
Save	Saves the log file into a text file format. Use the standard Save File window to navigate to and specify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

Figure 17: Results panel with measurement results



Description	Pass/Fail	Details	Value	Units	Margin
Lane1					
Random Jitter (RJ) Measurements UHBR10 TP2	Pass	Lane1_UHBR10 PRBS15_UHBR10_P0_800 _SSCEnable_40_100_SE_T P2	0.0061	UI	0.1139
Eye diagram testing UHBR10 TP2	Pass	Lane1_UHBR10 PRBS15_UHBR10_P0_800 _SSCEnable_40_100_SE_T P2	0	Hits	0
Total Jitter (TJ) Measurement UHBR10 TP2	Pass	Lane1_UHBR10 PRBS15_UHBR10_P0_800 _SSCEnable_40_100_SE_T P2	0.1361	UI	0.2439
UDJ Measurement UHBR10 TP2	Pass	Lane1_UHBR10 PRBS15_UHBR10_P0_800 _SSCEnable_40_100_SE_T P2	0.018	UI	0.152
DDJ Measurement UHBR10 TP2	Pass	Lane1_UHBR10 PRBS15_UHBR10_P0_800 _SSCEnable_40_100_SE_T P2	0.0676	UI	0.0424
UJ Measurement UHBR10 TP2	Pass	Lane1_UHBR10 PRBS15_UHBR10_P0_800 _SSCEnable_40_100_SE_T P2	0.0685	UI	0.1915
SSC Phase Deviation Measurement UHBR10 TP2	Informative	Lane1_UHBR10 PRBS15_UHBR10_P0_800 _SSCEnable_40_100_SE_T P2	2.7476	ps	N.A

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.

Select report generation options

This section describes the report generation settings you can configure in 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.

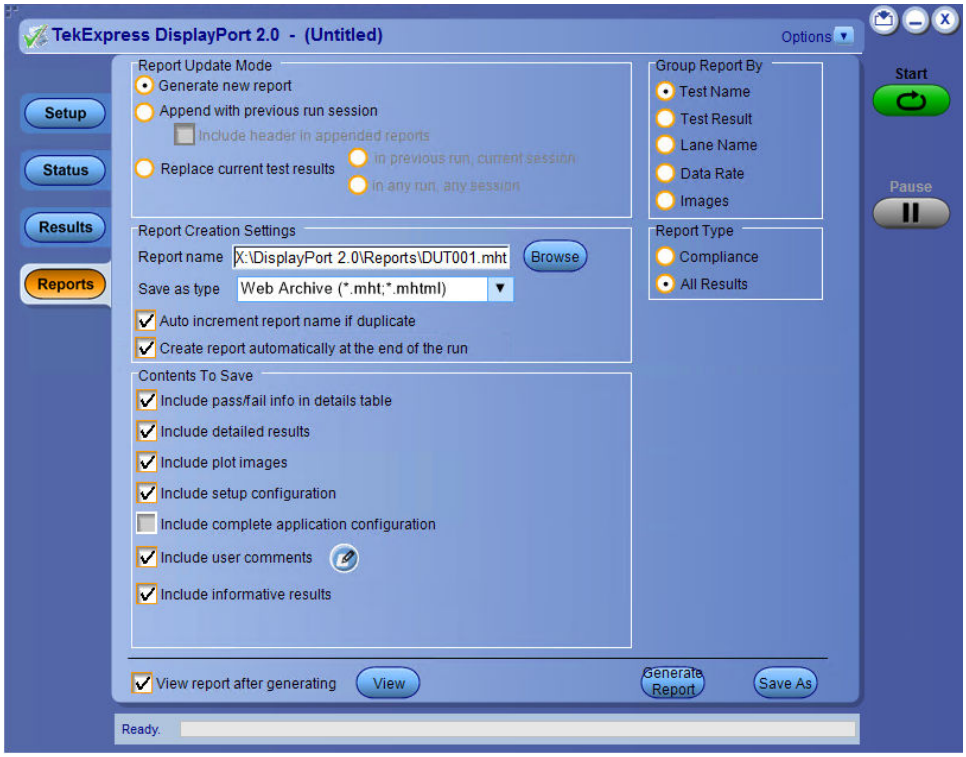


Figure 18: Reports panel

Report Update Mode Settings

Table 15: Report Update Mode Settings

Control	Description
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.

Table continued…

Control	Description
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 drop-down 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.
Create report automatically at the end of the run	Select to create the report with the settings configured, at the end of run.
Contents To Save Settings	

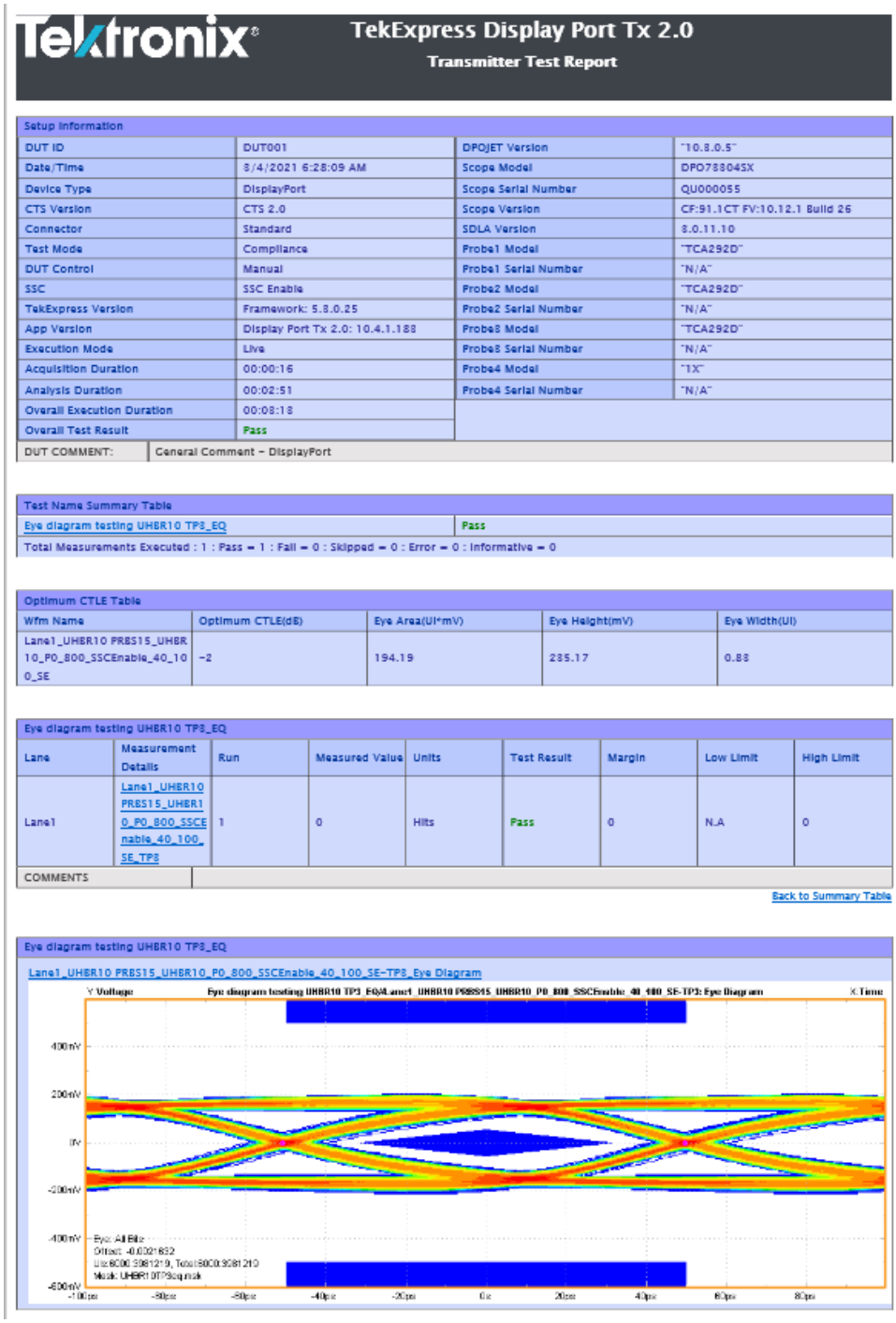
Table continued…

Control	Description
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 Informative Results	Select to include results for informative tests.
Other settings in report panel	
View report after generating	Automatically opens the report in a Web browser when the test execution is complete. This option is selected by default.
View	Click to view the most current report.
Generate Report	Generates a new report based on the current analysis results.
Save As	Specify a name for the report.
Group Report By	
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 image in the report
Report Type	
Compliance	Select to include compliance results
All results	Select to include all results.

View a generated report

Sample report and its contents

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



Tektronix

TekExpress Display Port Tx 2.0

Transmitter Test Report

Setup Information			
DUT ID	DUT001	DPOJET Version	"10.8.0.5"
Date/Time	8/4/2021 6:28:09 AM	Scope Model	DPO78304SX
Device Type	DisplayPort	Scope Serial Number	QU000055
CTS Version	CTS 2.0	Scope Version	CF:91.1CT FV:10.12.1 Build 26
Connector	Standard	SDLA Version	8.0.11.10
Test Mode	Compliance	Probe1 Model	"TCA292D"
DUT Control	Manual	Probe1 Serial Number	"N/A"
SSC	SSC Enable	Probe2 Model	"TCA292D"
TekExpress Version	Framework: 5.8.0.25	Probe2 Serial Number	"N/A"
App Version	Display Port Tx 2.0: 10.4.1.188	Probe3 Model	"TCA292D"
Execution Mode	Live	Probe3 Serial Number	"N/A"
Acquisition Duration	00:00:16	Probe4 Model	"1X"
Analysis Duration	00:02:51	Probe4 Serial Number	"N/A"
Overall Execution Duration	00:08:18		
Overall Test Result	Pass		
DUT COMMENT:	General Comment - DisplayPort		

Test Name Summary Table	
Eye diagram testing UHBR10 TP3_EQ	Pass
Total Measurements Executed : 1 : Pass = 1 : Fail = 0 : Skipped = 0 : Error = 0 : Informative = 0	

Optimum CTLE Table				
Wfm Name	Optimum CTLE(dB)	Eye Area(UI*mV)	Eye Height(mV)	Eye Width(UI)
Lane1_UHBR10 PRBS15_UHBR10_P0_800_SSCEnable_40_100_SE	-2	194.19	235.17	0.88

Eye diagram testing UHBR10 TP3_EQ								
Lane	Measurement Details	Run	Measured Value	Units	Test Result	Margin	Low Limit	High Limit
Lane1	Lane1_UHBR10 PRBS15_UHBR10_P0_800_SSCEnable_40_100_SE_TP3	1	0	Hits	Pass	0	N.A	0
COMMENTS								

Back to Summary Table

Eye diagram testing UHBR10 TP3_EQ

Lane1_UHBR10 PRBS15_UHBR10_P0_800_SSCEnable_40_100_SE-TP3_Eye Diagram

Figure 19: Report for DisplayPort2.0

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.
Test Name Summary Table	The test summary table lists all the tests which are executed with its result status.
Measurement	The measurement table displays the measurement related details with its parameter value.
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.
Optimum CTLE Table	The Optimum CTLE Table shows the details of the optimum CTLE for all TP3_EQ measurements.

Saving and recalling test setup

Test setup files overview

Saved test setup information (such as the selected oscilloscope, general parameters, acquisition parameters, measurement limits, waveforms (if applicable), and other configuration settings) are saved under the setup name at X:\<Application Name>.

Use test setups to:

- Run a new session, acquire live waveforms, using a saved test configuration.
- 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.

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**.
- Select the setup from the list and click **Open**. Setup files are located at X:\<Application Name>.

Select a pre-run session from the loaded test setup

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

1. Select **Options > Open Test Setup**.
2. Select a setup from the list and then click **Open**. Setup files are located at `X:\<Application Name>\`.
3. Switch the mode to **Pre-recorded waveform files** in the DUT panel.
4. Select the required waveforms from the selected setup in the Acquisition tab and **Run** the required test.

Save the test setup with a different name

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

1. Select **Options > Open Test Setup**.
2. Select a setup from the list and then click **Open**.
3. Click application setup and modify the parameters.
4. Click application reports and modify the report options.
5. Select **Options > Save Test Setup As**.
6. Enter the test setup name and click **Save**.

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.

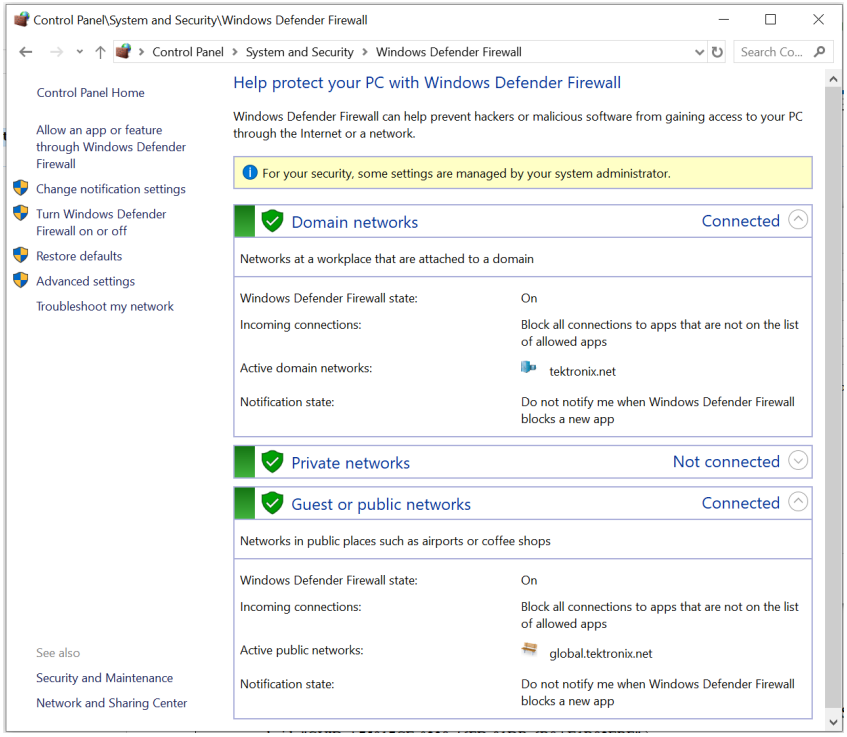
Note: If you are using an external PC to execute the remote interface commands, then install TekVISA in the PC to make the configurations.

Socket configuration for SCPI commands

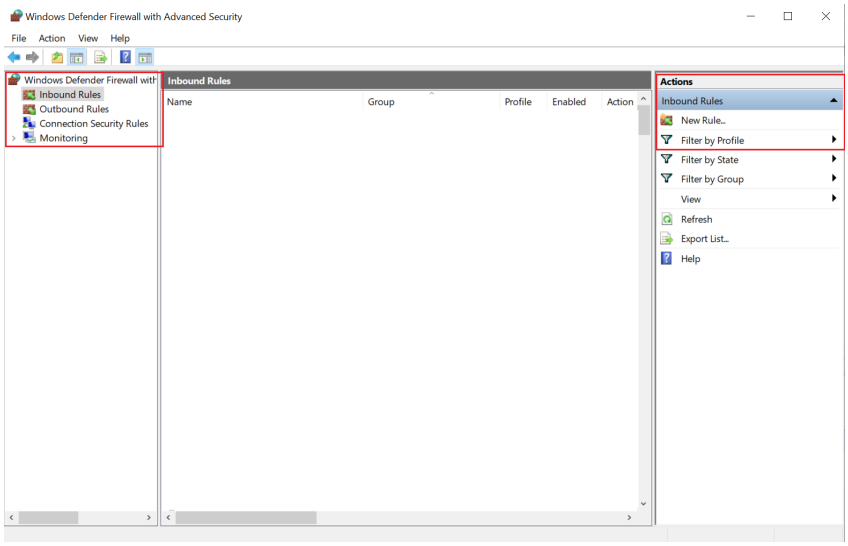
This section describes the steps to configure the TCPIP socket configuration in your script execution device and the steps to configure the TekVISA configuration in the oscilloscope to execute the SCPI commands.

TCPIP socket configuration

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

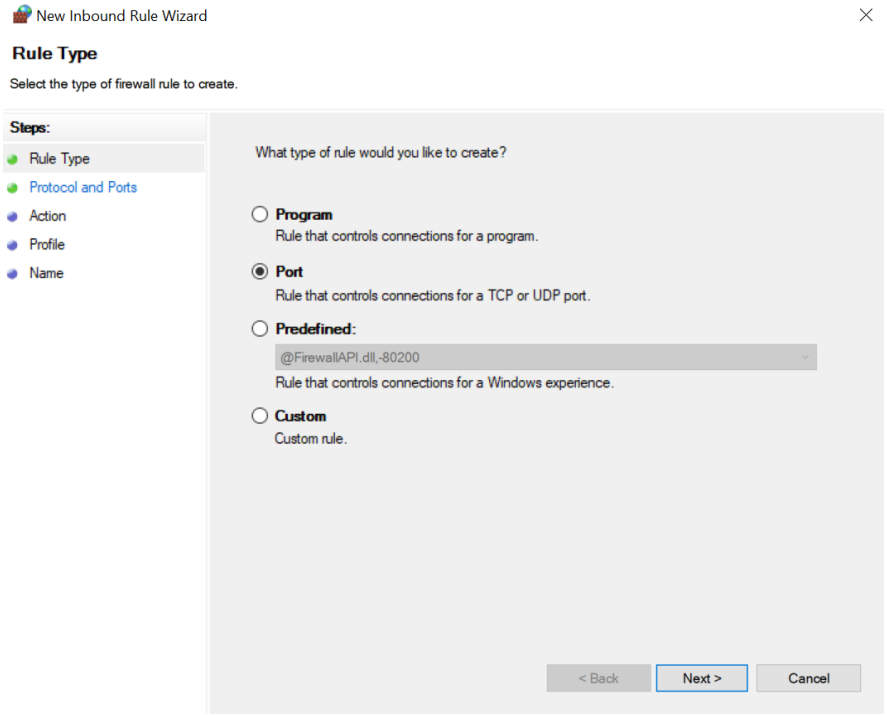


2. In Windows Firewall with Advanced Security menu, select **Windows Firewall with Advanced Security on Local Computer** > **Inbound Rules** and click **New Rule…**

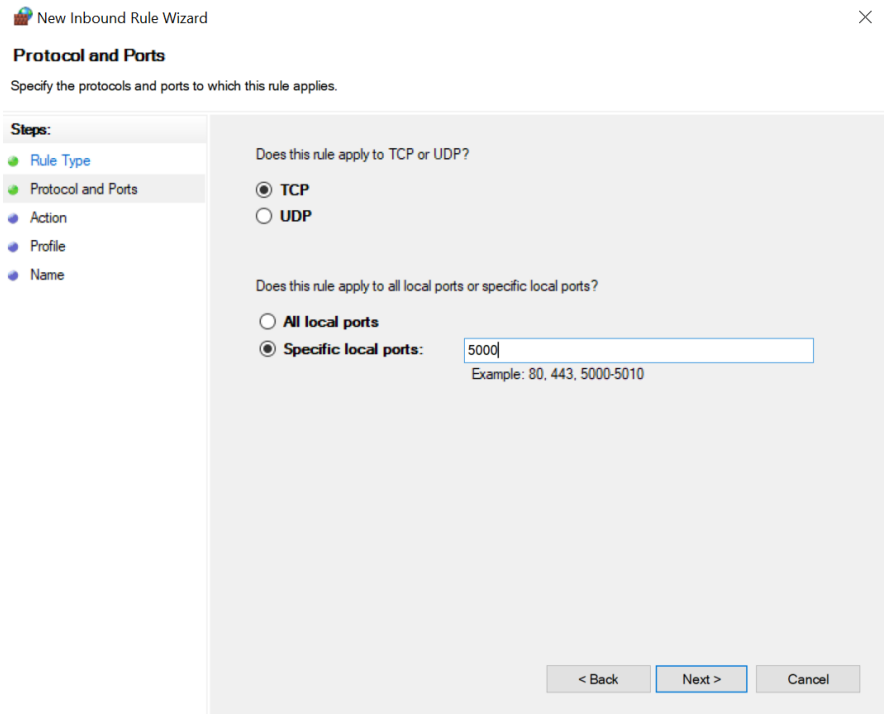


3. In **New Inbound Rule Wizard** menu

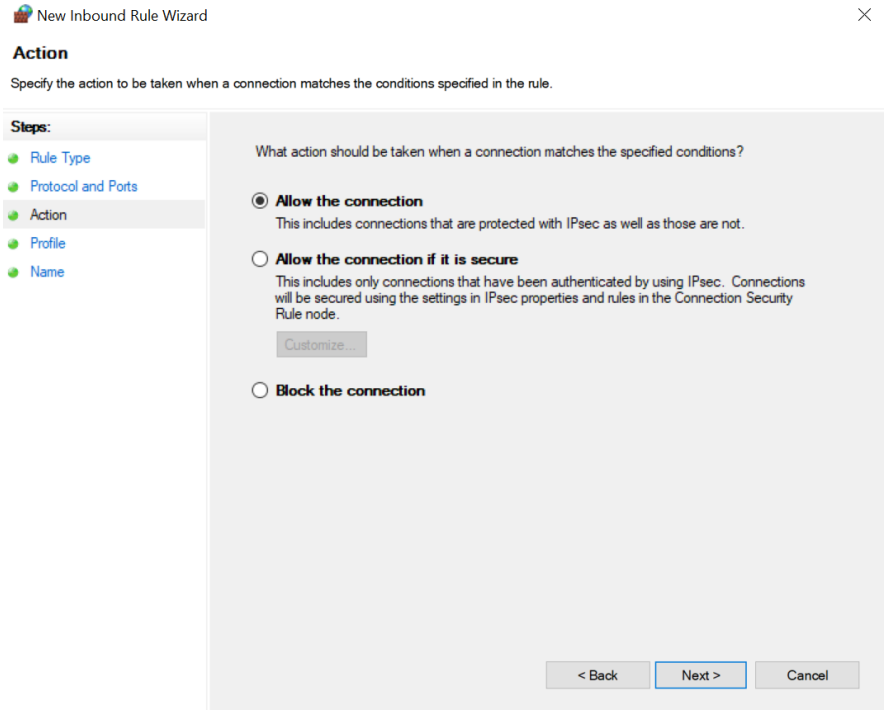
   a. Select **Port** and click **Next**.



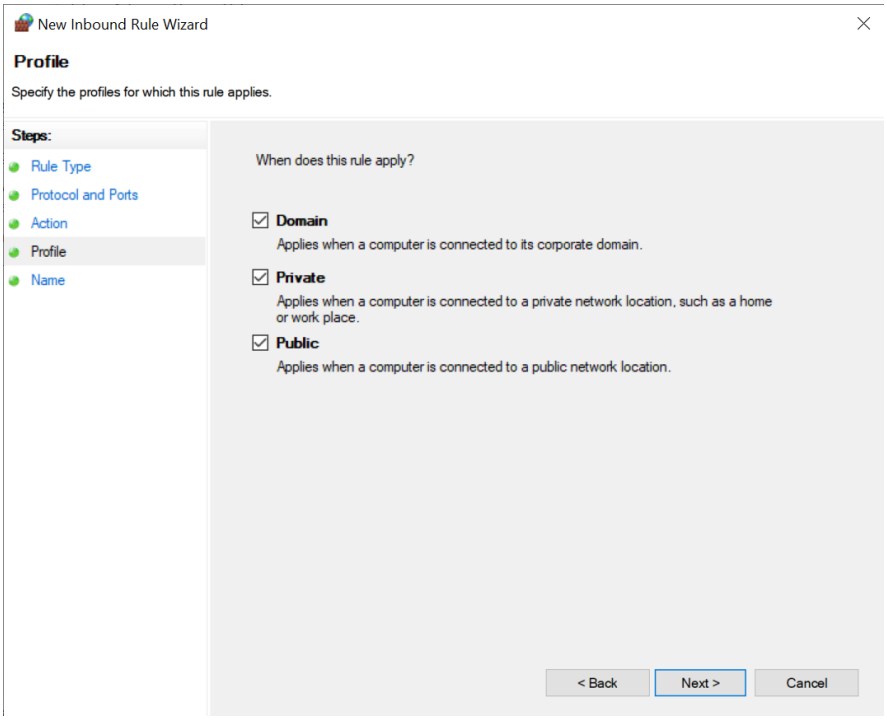
   b. Select **TCP** as rule apply, enter 5000 for **Specific local ports** and click **Next**.



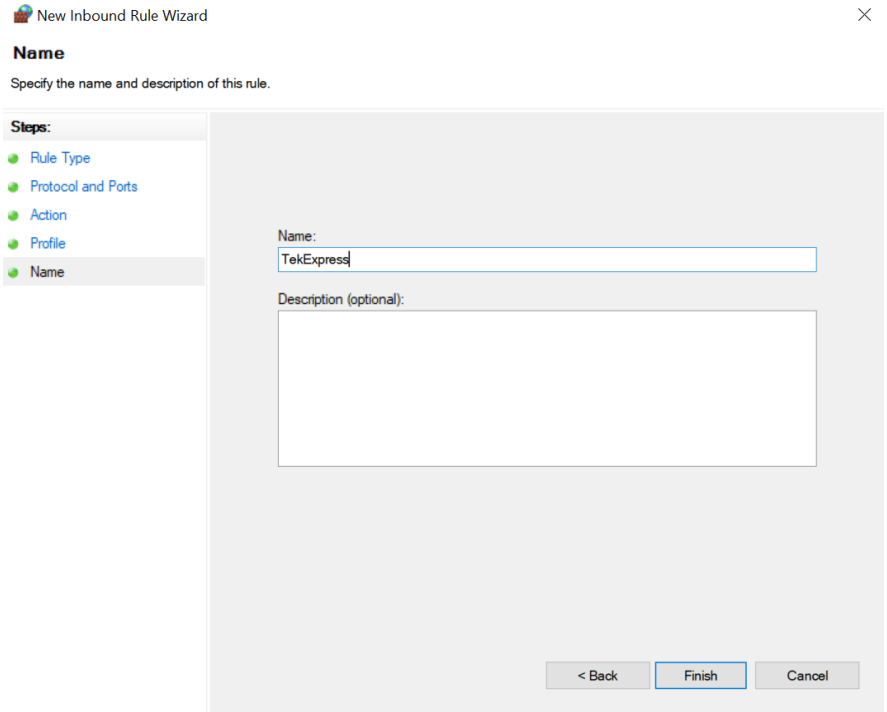
c. Select **Allow the connection** and click **Next**.



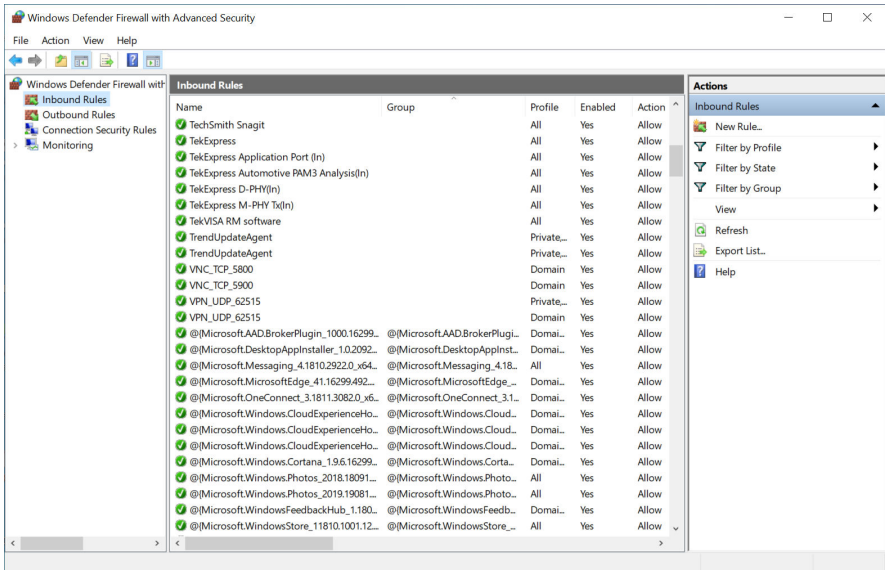
d. Select **Domain, Private, Public** checkbox and click **Next**.



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

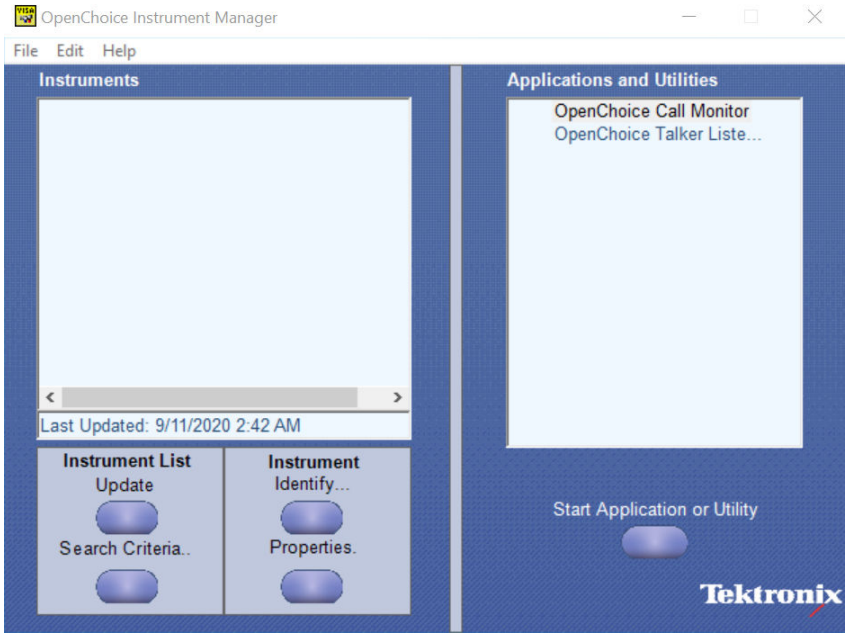


4. Check whether the Rule name is displayed in **Windows Firewall with Advanced Security menu** > **Inbound Rules**.



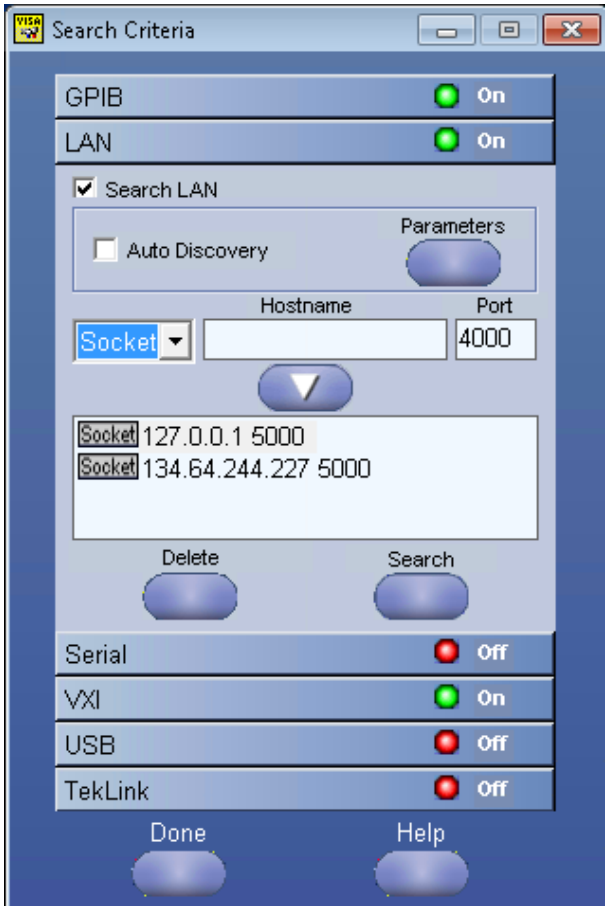
TekVISA configuration

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

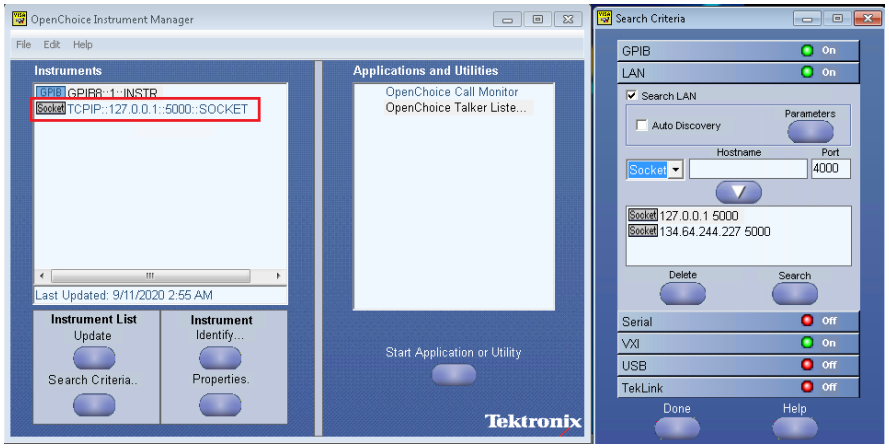


2. Click **Search Criteria**. In **Search Criteria** menu, click **LAN** to Turn-on. Select **Socket** from the drop-down list, enter the IP address of the TekExpress device in **Hostname** and type **Port** as 5000. Click  to configure the IP address with Port.

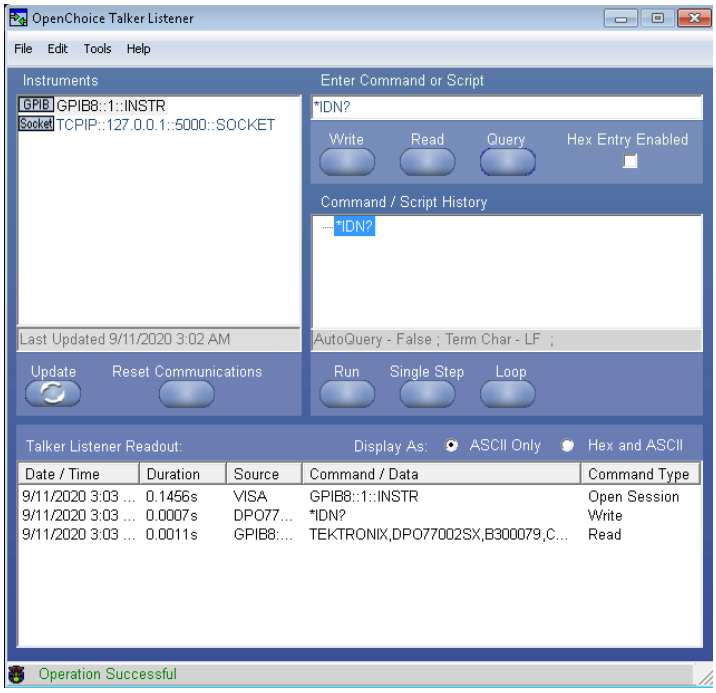
   Enter the Hostname as 127.0.0.1 if the TekVISA and TekExpress application are in the same system, else enter the IP address of the oscilloscope where the TekExpress application is running.



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,"<DeviceName>"` command sets the device name of the application.

`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,"<ALL>"` (Set)

`TEKEXP:SELECT? TEST` (Query)

Command arguments

TestName	Value
• Eye Diagram Testing • Data Dependent Jitter (DDJ) Measurement • Random Jitter (RJ) Measurement • Total Jitter (TJ) Measurement • Uncorrelated Jitter (UJ) Measurement • Uncorrelated Deterministic Jitter (UDJ) Measurement • Low Frequency Uncorrelated Deterministic Jitter (LFUDJ)Measurement • SSC Down Spread Rate Measurement • SSC Phase Deviation Measurement • SSC Slew Rate Measurement • Unit Interval Measurement	{True | False} or {1 | 0} It represents selected or unselected. Where, True or 1 - Selected False or 0 - Unselected

Returns

{True | False} or {1 | 0}

Examples

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

`TEKEXP:SELECT TEST,"<ALL>"` command select all the tests 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)

Command arguments

Table 16: General command parameters

ParameterName	Value
Connector	• Standard • Type C
UHBR10	• Included • Excluded
UHBR13.5	• Included • Excluded
UHBR20	• Included • Excluded
Voltage swing-800mV	• Included • Excluded
SignalPreset_UHBR10	• P0 • P01 • P02 • P03 • P04 • P05 • P06 • P07 • P08 • P09 • P10 • P11 • P12 • P13 • P14 • P15

Table continued…

ParameterName	Value
SignalPreset_UHBR13.5	• P0 • P01 • P02 • P03 • P04 • P05 • P06 • P07 • P08 • P09 • P10 • P11 • P12 • P13 • P14 • P15
SignalPreset_UHBR20	• 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
FilterfileDeEmbedPos	C:\Users\Public\Tektronix\TekApplications\DisplayPort20\Filters\RF_Cable_Deembed_POS.flt

Table continued…

ParameterName	Value
FilterfileDeEmbedNeg	C:\Users\Public\Tektronix\TekApplications\DisplayPort20\Filters\RF_Cable_Deembed_Neg.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

Table 17: Report panel command parameters

<ParameterName>	<Value>
Report Update Mode	• New • Append • Replace
Report name	X:\\Reports\DUT001.mht
Save As Type	• Web Archive (*.mht;*.mhtml) • PDF (*.pdf;) • CSV (*.csv;)
Auto increment report name if duplicate	{True | False} or {1 | 0} It represents selected or unselected. Where, • True or 1 - Selected • False or 0 - Unselected
Create report at the end	{True | False} or {1 | 0} It represents selected or unselected. Where, • True or 1 - Selected • False or 0 - Unselected

Table continued…

<ParameterName>	<Value>
Include Pass/Fail Results Summary	{True | False} or {1 | 0} It represents selected or unselected. Where, • True or 1 - Selected • False or 0 - Unselected
Include Detailed Results	{True | False} or {1 | 0} It represents selected or unselected. Where, • True or 1 - Selected • False or 0 - Unselected
Include Plot Images	{True | False} or {1 | 0} It represents selected or unselected. Where, • True or 1 - Selected • False or 0 - Unselected
Include Setup Configuration	{True | False} or {1 | 0} It represents selected or unselected. Where, • True or 1 - Selected • False or 0 - Unselected
Include Complete Application Configuration	{True | False} or {1 | 0} It represents selected or unselected. Where, • True or 1 - Selected • False or 0 - Unselected
Include User Comments	{True | False} or {1 | 0} It represents selected or unselected. Where, • True or 1 - Selected • False or 0 - Unselected

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

TestName	AcquireType	ParameterName	ParameterValue
Eye Diagram Testing	PRBS15	SignalPreset	• P0 • P01 • P02 • P03 • P04 • P05 • P06 • P07 • P08 • P09 • P10 • P11 • P12 • P13 • P14 • P15
Data Dependent Jitter (DDJ) Measurement			
Random Jitter (RJ) Measurement			
Total Jitter (TJ) Measurement			
Uncorrelated Jitter (UJ) Measurement			
Uncorrelated Deterministic Jitter (UDJ) Measurement			
Low Frequency Uncorrelated Deterministic Jitter (LFUDJ) Measurement			
SSC Down Spread Rate Measurement			
SSC Phase Deviation Measurement			
SSC Slew Rate Measurement			
Unit Interval Measurement			

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)

Command arguments

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

TestName	String
Eye Diagram Testing	Eye Diagram Testing UHBR10 TP2
	Eye Diagram Testing UHBR10 TP3
	Eye Diagram Testing UHBR13.5 TP2
	Eye Diagram Testing UHBR13.5 TP3
	Eye Diagram Testing UHBR20 TP2
	Eye Diagram Testing UHBR20 TP3
Data Dependent Jitter (DDJ) Measurement	Data Dependent Jitter (DDJ) Measurement UHBR10 TP2
	Data Dependent Jitter (DDJ) Measurement UHBR10 TP3
	Data Dependent Jitter (DDJ) Measurement UHBR13.5 TP2
	Data Dependent Jitter (DDJ) Measurement UHBR13.5 TP3
	Data Dependent Jitter (DDJ) Measurement UHBR20 TP2
	Data Dependent Jitter (DDJ) Measurement UHBR20 TP3
Random Jitter (RJ) Measurement	Random Jitter (RJ) Measurement UHBR10 TP2
	Random Jitter (RJ) Measurement UHBR10 TP3
	Random Jitter (RJ) Measurement UHBR13.5 TP2
	Random Jitter (RJ) Measurement UHBR13.5 TP3
	Random Jitter (RJ) Measurement UHBR20 TP2
	Random Jitter (RJ) Measurement UHBR20 TP3
Total Jitter (TJ) Measurement	Total Jitter (TJ) Measurement UHBR10 TP2
	Total Jitter (TJ) Measurement UHBR10 TP3
	Total Jitter (TJ) Measurement UHBR13.5 TP2
	Total Jitter (TJ) Measurement UHBR13.5 TP3
	Total Jitter (TJ) Measurement UHBR20 TP2
	Total Jitter (TJ) Measurement UHBR20 TP3
Uncorrelated Jitter (UJ) Measurement	Uncorrelated Jitter (UJ) Measurement UHBR10 TP2
	Uncorrelated Jitter (UJ) Measurement UHBR10 TP3
	Uncorrelated Jitter (UJ) Measurement UHBR13.5 TP2
	Uncorrelated Jitter (UJ) Measurement UHBR13.5 TP3
	Uncorrelated Jitter (UJ) Measurement UHBR20 TP2
	Uncorrelated Jitter (UJ) Measurement UHBR20 TP3

Table continued…

TestName	String
Uncorrelated Deterministic Jitter (UDJ) Measurement	Uncorrelated Deterministic Jitter (UDJ) Measurement UHBR10 TP2
	Uncorrelated Deterministic Jitter (UDJ) Measurement UHBR10 TP3
	Uncorrelated Deterministic Jitter (UDJ) Measurement UHBR13.5 TP2
	Uncorrelated Deterministic Jitter (UDJ) Measurement UHBR13.5 TP3
	Uncorrelated Deterministic Jitter (UDJ) Measurement UHBR20 TP2
	Uncorrelated Deterministic Jitter (UDJ) Measurement UHBR20 TP3
Low Frequency Uncorrelated Deterministic Jitter (LFUDJ)Measurement	Low Frequency Uncorrelated Deterministic Jitter (LFUDJ)Measurement UHBR10 TP2
	Low Frequency Uncorrelated Deterministic Jitter (LFUDJ)Measurement UHBR13.5 TP2
	Low Frequency Uncorrelated Deterministic Jitter (LFUDJ)Measurement UHBR20 TP2
SSC Down Spread Rate Measurement	SSC Down Spread Rate Measurement UHBR10 TP2
	SSC Down Spread Rate Measurement UHBR13.5 TP2
	SSC Down Spread Rate Measurement UHBR20 TP2
SSC Phase Deviation Measurement	SSC Phase Deviation Measurement UHBR10 TP2
	SSC Phase Deviation Measurement UHBR13.5 TP2
	SSC Phase Deviation Measurement UHBR20 TP2
SSC Slew Rate Measurement	SSC Slew Rate Measurement UHBR10 TP2
	SSC Slew Rate Measurement UHBR13.5 TP2
	SSC Slew Rate Measurement UHBR20 TP2
Unit Interval Measurement	Unit Interval Measurement UHBR10 TP2
	Unit Interval Measurement UHBR13.5 TP2
	Unit Interval Measurement UHBR20 TP2

Returns

<String>

Examples

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

Query the avaliable 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:\<Application Name>\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:\<Application Name> \Untitled Session\DUT001\20200916_041609\Iter1_Short Record-length for SCOPE Period_NoSSC_DIFF.png";22794,"X:\<Application Name>\UntitledSession\DUT001\20 200916_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. Setup Information DUT ID: DUT001 Date/Time: 2020-10-22 11:24:39 Device Type: TX-Device TekExpress AppEmulator Version: 5.2.999.17 (DAILY) TekExpress Framework Version: 5.2.999.17_INTERNAL Spec Version: Spec 1.0 Overall Compliance Mode: Yes Overall Test Rasult: Pass Probe1 Model: "1X" Probe1 Serial Number: "N/A" Probe2 Model: "1X" Probe2 Serial Number: "N/A" Probe3 Model: "1X" Probe3 Serial Number: "N/A" Probe4 Model: "1X" Probe4 Serial Number: "N/A" Scope Model: DPO5104 Scope Serial Number: Not-Set SPC, FactoryCalibration: INIT,UNCAL Scope F/W Version: 10.8.1 Build 25 DPOJET Version: 10.1.0.64	<String>

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>
<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 sepcified 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 exists 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()
```

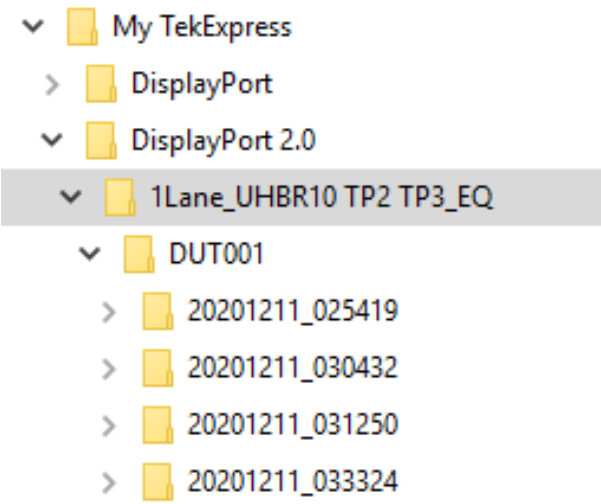
```
while (status == "RUNNING" or status == "ERROR" or status=="WAIT"):
print "Running..."
skt.sendall("TEKEXP:STATE?\n")
time.sleep(2)
status = str(skt.recv(1024))
status = status.strip()
if status == "ERROR\n" or status=="WAIT\n":
skt.sendall("TEKEXP:POPUP?\n")
status = str(skt.recv(1024))
print status
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\<Application Name>*. The application directory and associated files are organized as follows:



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

Table 18: 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
Licenses	Contains all the license files
Report Generator	Contains style sheets for report generation
Tools	Contains instrument and application specific files

File name extensions

The TekExpress <Application Name> software uses the following file name extensions:

Table 19: File name extension

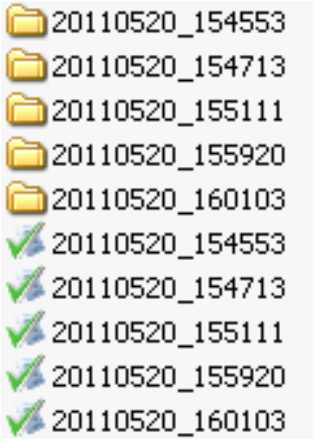
File name extension	Description
*.TekX	Application session files (the extensions may not be displayed)
*.py	Python sequence file.
*.xml	Test-specific configuration information (encrypted) files. Application log files
*.csv	Test result reports Plot data
*.mht	Test result reports (default) Test reports 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 Documents\<Application Name>\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: \<Application Name>. 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 2.0 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

Appendix-A

Following are the compliance parameters for all DisplayPort 2.0 measurements

Table 20: Compliance Parameters list for all DisplayPort 2.0 measurements

Test Name	Data Rate	Preset	Voltage Swing	SSC	Test Point
Eye Diagram Testing Data Dependent Jitter (DDJ) Measurement Random Jitter (RJ) Measurement Total Jitter (TJ) Measurement Uncorrelated Jitter (UJ) Measurement Uncorrelated Deterministic Jitter (UDJ) Measurement	• UHBR10 • UHBR13.5 • UHBR20	• P0 • P01 • P02 • P03 • P04 • P05 • P06 • P07 • P08 • P09 • P10 • P11 • P12 • P13 • P14 • P15	800 mV	• SSC Enabled • SSC Disabled • Both	• TP2 • TP3_EQ
Low Frequency Uncorrelated Deterministic Jitter (LFUDJ) Measurement Unit Interval Measurement	• UHBR10 • UHBR13.5 • UHBR20	• P0 • P01 • P02 • P03 • P04 • P05 • P06 • P07 • P08 • P09 • P10 • P11 • P12 • P13 • P14 • P15	800 mV	• SSC Enabled • SSC Disabled • Both	TP2

Table continued…

Test Name	Data Rate	Preset	Voltage Swing	SSC	Test Point
SSC Down Spread Rate Measurement	• UHBR10 • UHBR13.5 • UHBR20	• P0 • P01 • P02 • P03 • P04 • P05 • P06 • P07 • P08 • P09 • P10 • P11 • P12 • P13 • P14 • P15	800 mV	SSC Enabled	TP2
SSC Phase Deviation Measurement					
SSC Slew Rate Measurement					

Index

A

About SCPI command *54*
Acquisitions
    selecting *34*
Activate the license
    license *14*
Advanced View *31*

C

Channel deskew *89*
Comments
    adding to reports *30*
Compliance Mode *15*
Compliance View *15*, *31*
Connected instruments
    searching for *27*
Connection requirements *16*
Contacting Tektronix *11*
Conventions *10*
CTS version *31*

D

Deselect All (tests) *33*
Deskewing channels *89*
Downloading and installing the software
    Download the software
        Install the software *13*
DUT Automation *32*
DUT ID *30*
DUT settings *30*

E

Email Notifications *26*
Equipment setup *16*
Example *83*

F

Filter the test results *46*

G

Getting help and support *10*
Getting started *12*
GPIB *27*

H

Hardware requirements
    Hardware *12*

I

Icons used
    symbols *10*
Instruments
    discovering connected *27*

K

Key features *6*

L

LAN *27*
Lane source *34*
Lanes *34*
Launch the application *22*
license key *14*
Live waveforms *37*
load the saved test setup
    load the test setup *52*
Log view *45*
Log View *43*

M

My TekExpress folder *18*

N

Non-VISA *27*

O

Options menu
    Instrument control settings *27*
    Options menu functions *25*
Oscilloscopes supported *12*

P

Panels
    Setup *29*
Pre-recorded Mode *20*
Pre-recorded waveform files *20*, *35*
Pre-run checklist *18*

Preferences menu 46
Preferences tab
    Preferences 42
Probe configuration 34
Product documents
    TekExpress Application documents 10

R

recalling test setup 52
Remote commands 54
report generation 47
report generation options 47
report generation settings
    Configure report generation settings 47
Reports panel 47
Results panel 46

S

Save the configured test setup
    Save the test setup 52
Save the test setup 53
Save the test setup with a different name 53
Saving test setup 52
Schematic button 33
SCPI command 54
SCPI Commands
    SCPI 54
Select a loaded test setup 52
Select a pre-run session loaded test setup 52
Select All (tests) 33
Setting up the test environment
    test environment 15
Setup Panel 29
Signal Path Compensation (SPC) 20
Socket configuration for SCPI commands
    Socket configuration 54
Software requirements
    Softwares 13
software version 14
Start the application 22
Status panel 43
Support 11
System requirements 12

T

Technical support
    support 11
Tek Link 27
TEKEXP:*IDN? 74
TEKEXP:*OPC? 79
TEKEXP:ACQUIRE_MODE LIVE 74
TEKEXP:ACQUIRE_MODE? 74
TEKEXP:INFO? IMAGE 73
TEKEXP:INFO? REPORT 72
TEKEXP:INFO? WFM 73
TEKEXP:INSTRUMENT, "<InstrumentType>","<value>" 72
TEKEXP:INSTRUMENT? "<InstrumentType>" 72
TEKEXP:LASTERROR? 79
TEKEXP:LIST? DEVICE 68
TEKEXP:LIST? INSTRUMENT,"<Real Time Scope>" 72
TEKEXP:LIST? SUITE 68
TEKEXP:LIST? TEST 70
TEKEXP:LIST? VERSION 71
TEKEXP:MODE COMPLIANCE 74
TEKEXP:MODE? 74
TEKEXP:POPUP "Yes" 79
TEKEXP:POPUP? 79
TEKEXP:REPORT GENERATE 75
TEKEXP:REPORT? "<Device Field>" 75
TEKEXP:RESULT? "<TestName>" 76
TEKEXP:RESULT? "<TestName>","<ColumnName>" 76
TEKEXP:RESULT? "<TestName>","<ColumnName>",<RowNumber> 76
TEKEXP:SELECT DEVICE,"DeviceName" 60
TEKEXP:SELECT SUITE,"<SuiteName>" 61
TEKEXP:SELECT TEST,"<ALL>" 61
TEKEXP:SELECT TEST,"<TestName>",1 61
TEKEXP:SELECT VERSION,”<VersionName>” 62
TEKEXP:SELECT? DEVICE 60
TEKEXP:SELECT? SUITE 61
TEKEXP:SELECT? TEST 61
TEKEXP:SELECT? VERSION 62
TEKEXP:SETUP Default 76
TEKEXP:SETUP Open,"<SessionName>" 77
TEKEXP:SETUP Save,"<SessionName>" 77
TEKEXP:SETUP? CURRENT 77
TEKEXP:STATE RUN 78
TEKEXP:STATE? 78
TEKEXP:STATE? SETUP 78
TEKEXP:VALUE ACQUIRE,”<TestName>","<AcquireType>","<ParameterName>","<ParameterValue>" 67
TEKEXP:VALUE ANALYZE,”<TestName>","<ParameterName>","<ParameterValue>" 68
TEKEXP:VALUE DUTID,"Value" 61
TEKEXP:VALUE GENERAL,"<ParameterName>","<Value>" 63
TEKEXP:VALUE GENERAL,"View Report After Generating",<value> 80
TEKEXP:VALUE LIMIT,<TestName>,<LimitHeader>,<Value1>,<CompareString>,<Value2> 81
TEKEXP:VALUE VERBOSE,"<Value>" 80
TEKEXP:VALUE WFMFILE,<TestName>,<AquireType>,<WaveformFileName> 81
TEKEXP:VALUE? ACQUIRE,”<TestName>">","<AcquireType>","<ParameterName>" 67
TEKEXP:VALUE? ANALYZE,”<TestName>","<ParameterName>" 68

TEKEXP:VALUE? DUTID *61*
TEKEXP:VALUE? GENERAL,"<ParameterName>" *63*
TEKEXP:VALUE? GENERAL,"View Report After Generating" *80*
TEKEXP:VALUE? LIMIT,<TestName>,<LimitHeader> *81*
TEKEXP:VALUE? VERBOSE *80*
TEKEXP:VALUE? WFMFILE,<TestName>,<AquireType> *81*
test execution status *43*
Test Lanes *32*
test run preferences *42*
Test selection controls *33*
Test setup files overview
    Test setup files *52*
Test Status *43*, *44*
Tests
    running *18*
    running prerecorded *20*
    selecting *33*
    setting up *15*

U

Untitled Session folder *18*

V

View a report *50*
View option *31*
View summary of test results
    summary of test results *46*
View test execution logs *45*
View the test execution status *44*

W

Waveform files
    using pre-recorded *35*
Waveforms
    acquiring live *37*