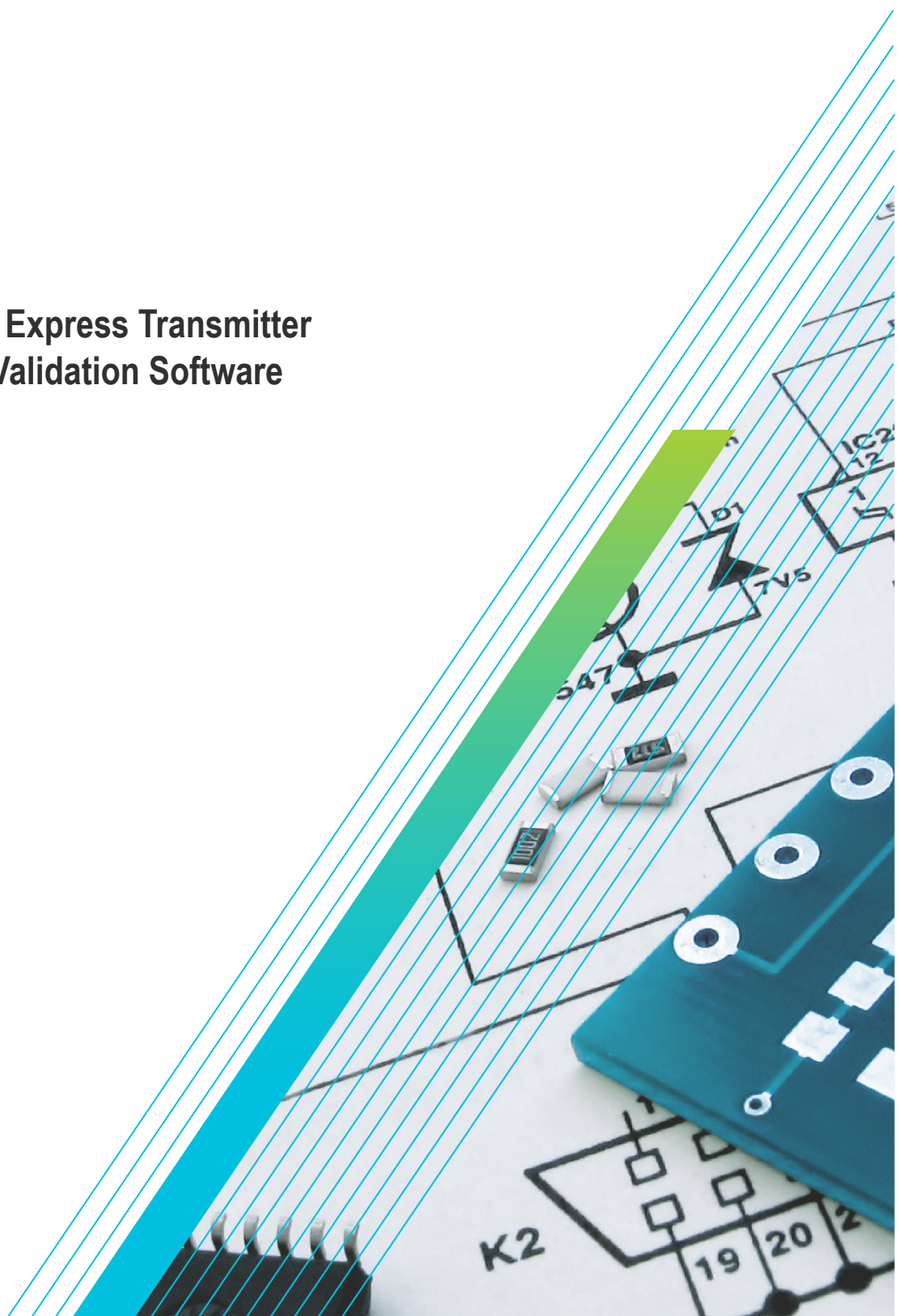




**TekExpress® PCI Express Transmitter
Compliance and Validation Software
Application Help**



077-1762-01





**TekExpress® PCI Express Transmitter
Compliance and Validation Software
Application Help**

Register now!
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077-1762-01

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

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

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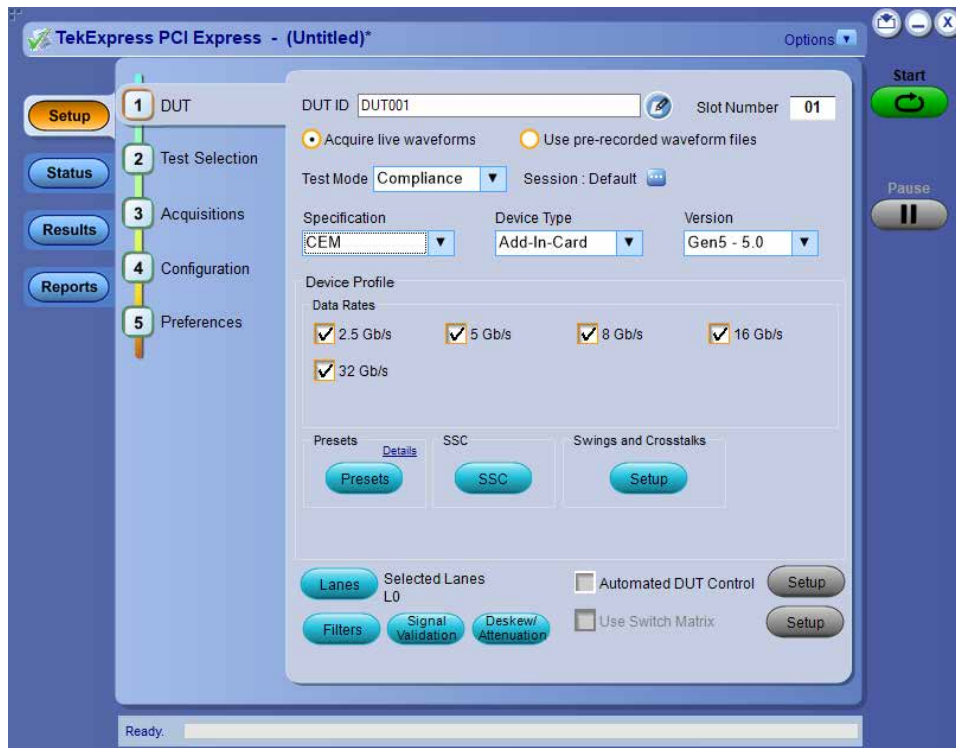
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Welcome

The TekExpress® PCI Express Automated Test Solution Software application (referred to as TekExpress PCIe or PCIe in the rest of the document) provides an automated, simple, and efficient way to test PCI Express interfaces and devices consistent to the requirements of the PCI Express specifications.



TekExpress PCIe key features and benefits

- **New features from current release:**
 - Support for Gen6 PWJ measurements using PAMJET tool.
 - Integration of Automated Scope noise characterization and compensation for Gen6.
 - Integration of CTLE optimization for Gen6 jitter measurements.
 - Support for Mini-Circuits RF Switch for Gen1-5 testing.
 - Improvement in Gen6 Preset Test feature.
 - Updated Gen6 Preset tests limits as per latest spec.
 - Support for Intel Clock Jitter Tool (CJT) for Ref Clock testing.
 - Support for Sigtest Phoenix v5.1.04 for Gen5 CEM Signal and preset tests.
- **Existing Features:**
 - PCIe CEM TX Testing
 - Supports Add-In-Card and System Board device types
 - Supports Gen1, Gen2, Gen3, Gen4, and Gen5 versions
 - Supports Signal Quality Test for all generations
 - Supports Preset Test for Gen3, Gen4, and Gen5 generations
 - Supports Pulse Width Jitter Test for Gen4 and Gen5 Add-In-Card device type
 - PCIe Base TX testing

- Supports both PCIe Gen5 Base Tx Common Clock & SRIS architecture
- Supports Gen3, Gen4, and Gen5 versions
- Supports Jitter & Voltage Signal Quality Test and Preset Test for all generations
- U.2 (SFF-8639) TX Testing
 - Supports Gen3 Host and Module device types
- M.2 TX Testing
 - Supports Gen3 M.2 Add-In-Card and Host device types
- PCIe Ref Clock TX Testing
 - Supports Gen3, Gen4, and Gen5 versions of CXL Base, CEM Card and CEM Host type device testing.
- PCIe CXL Testing
 - Supports Gen1 to Gen5 Ref Clock Jitter and Signal Integrity measurements
- Tektronix ATI (200GS/s) channel support for CEM, Base Spec, U.2, M.2 and Ref clock testing for all generations (Not applicable for CEM System Board Gen1-4 and U.2 Host Gen3)
- Supports channel embed and de-embed filter files
- Supports de-embedding on each ATI channel using separate filter files
- Supports Intel CJT, Skyworks Clock Jitter tool or DPOJet for ref clock analysis
- Supports traditional break-out channel de-embedding & SigTest CTLE (for uncorrelated jitter measurements only)
- Automated De-skew and attenuation for ATI Channels
- Supports single and multiple acquisition for CEM Gen4 and Gen5
- Trigger type support for Gen3, Gen4, and Gen5 (Auto/Width/Edge)
- Automated toggling of the DUT to switch presets for CEM, U.2, and M.2 device types using AWG/AFG/GRL PHY Test Controller/NI USB 6501 DUT Controller.
- Simple push button, enabling the users to manually toggle PCIe presets from AWG/AFG
- Support for Gen4 and Gen5 dataclock pattern custom toggle index in non standard devices.
- RF Switch support to test the x12 and x16 lanes using Keithley and Gigatronics switches respectively
- Fully automated General, Jitter, Composite Eye, Transition Eye, and Non Transition Eye measurements
- Provides individual or group test selection by using a tree-structure menu
- Supports preset test selection for all device types
- Integrated Intel Sigtest for fully automated waveform analysis
 - Supports parallel execution of measurements using multiple instances of SigTest to accelerate the test analysis speed
 - Deploys recommended versions of SigTests for analysis
 - Sigtest Phoenix v5.1.03: PCIe Gen5 CEM Spec
 - Sigtest v4.0.52: PCIe Gen4 CEM Spec, Gen4 and Gen5 Base Spec
 - Sigtest v4.0.42: PCIe Gen3 Base spec
 - Sigtest v3.2.0.3: PCIe Gen3 CEM Spec
 - Option to browse and select different Sigtest versions and templates for debug
 - Support Sigtest run in silent mode (Not applicable for Sigtest v3.2.0.3)
- Built-in reporting features:
 - Provides a Pass/Fail summary table
 - Provides generation specific pass/fail status summary table
 - Provides margin details on each test
 - Provides a consolidated report for all tests

- Supports .pdf, .mht and .csv formats
- Provides Tektronix Method of Implementation (MOI) for PCIe testing Run-time setup instructions with image pop-ups and reference illustrations for each test execution
- Provides both an automation solution (for compliance) and DPOJET (for debug)
- TekExpress setup files in-line with PCI-SIG Compliance Workshop
- Supports SCPI commands to remotely communicate with the TekExpress application
- 33 GHz Oscilloscope supports CEM Gen5 TX testing using Tekconnect channels.
- Supports Eye Diagram plots for Base Spec through DPOJET
- Support for PCIe Gen6 Base Spec TX signal quality test using PAMJet and DPOJet analysis tools.
- Support for PCIe Gen6 Base Spec TX preset test.
- Support for Base Spec Gen6 signal validation using PAMJet tool.
- Improved UI look and feel.

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	TekExpress PCI Express Help
How to remotely control the instrument	<p>PDF version of this document can be downloaded from www.tek.com/downloads</p> <p>Compiled HTML (CHM) version is integrated with the application. Press F1 key from the keyboard to start the help.</p> <p>Tektronix Part Number: 077-xxxx-xx</p>

Conventions

This application help uses the following conventions:

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

Minimum system requirements

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

Table 3: System requirements

Component	Requirement
Oscilloscope	See Instruments and accessories required
Processor	Same as the oscilloscope
Operating system	Microsoft Windows 10 (64-bit only) Required Windows 10 user account settings
Memory	Same as the oscilloscope
Hard disk	Same as the oscilloscope
Display	Same as the oscilloscope ¹
Firmware	Tekscope for MSO/DSA/DPO70000C, D, DX, SX ²
Software	<ul style="list-style-type: none"> • DPOJET, Jitter and Eye Diagram Analysis Tool² • PAMJet Analysis Tool ^{2 3} • Microsoft .NET 4.0 Framework • Microsoft Internet Explorer 8.0 SP1 or later • PyVisa version 1.0.0 • IronPython version 2.7.3 • 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

¹ If TekExpress is running on an instrument having a video resolution lower than 800x600 (for example, a sampling oscilloscope), it is recommended that you connect a secondary monitor, which must be enabled before starting the application.

² For software version, refer to Readme TekExpress PCI Express.txt file at C:\Program Files\Tektronix\TekExpress\TekExpress PCI Express

³ The TekExpress PCIe Installer does not install PAMJet application. User needs to install the right PAMJet software and ensure that the option key is enabled.

Instruments and accessories required

The following table lists the instruments and accessories required for TekExpress PCI Express application.

Table 4: Instruments and accessories required for PCI Express application

Instrument/Accessory	Model number
Oscilloscope	MSO70604 ⁴ , DPO/MSO70604C (Gen1 testing only) MSO70804 ⁴ , DPO/MSO70804C (Gen1 and Gen2 testing) MSO71254 ⁴ , DPO/MSO71254C (Gen1, Gen2, and Gen3 testing only) MSO71604 ⁴ , DPO/MSO71604C (Gen1, Gen2, and Gen3 testing) MSO72004 ⁴ , DPO/MSO72004C (Gen1, Gen2, and Gen3 testing) DPO/MSO72304DX (Gen1, Gen2, and Gen3 testing) DPO/DSA72504D (Gen1, Gen2, Gen3, and Gen4 testing) DPO/DSA73304D (all generation testing) DPO/MSO72304DX (Gen1, Gen2, and Gen3 testing) DPO/MSO72504DX (all generation testing) DPO/MSO73304DX (Gen1, Gen2, Gen3, and Gen4 testing) DPO71304SX (Gen1, Gen2, and Gen3 testing) DPO71604SX (Gen1, Gen2, and Gen3 testing) DPO72304SX (Gen1, Gen2, and Gen3 testing) DPO73304SX All Generation Testing DPO75002SX [Standalone or 2 Stack] All Generation Testing DPO75902SX [Standalone or 2 Stack] All Generation Testing DPO77002SX [Standalone or 2 Stack] All Generation Testing
Arbitrary Function Generator (AFG) ⁵ (for automatic test pattern toggling)	Tektronix AFG3252, AFG3252C, AFG31252
Arbitrary Waveform Generator (AWG) (for automatic test pattern toggling)	<ul style="list-style-type: none"> • Tektronix AWG5002B/C, AWG5012B/C, AWG5014B/C • Tektronix AWG7082B/C, AWG7122B/C • Tektronix AWG70001A, AWG70002A
RF Switch ^{6 7}	<ul style="list-style-type: none"> • Keithley System S46T RF Microwave Switch Systems for x12 PCIe • Gigatronics RF Switch 26GHz (8902-L-48TS26) for x16 PCIe • MiniCircuit ZTM6SP4T40 for x12 PCIe • MiniCircuit ZTM28SP6T40 for x16 PCIe

Table continued...

⁴ Requires Microsoft Windows 10 (64-bit) operating system. Contact your local Tektronix Customer Service representative for upgrade information.

⁵ The listed AFG/AWG instruments support both differential inputs (requires 2 channels) and 100 MHz burst mode.

⁶ Use GPIB cable or USB-to-GPIB or USB cable to connect the oscilloscope to switch.

⁷ The GPIB address of the RF Switch and toggle instrument (AWG/AFG) must be different.

Instrument/Accessory	Model number
GRL PCIE34 Controller for automatic test pattern toggling and DUT power cycle ⁸	Part number : GRL-PCIE34-P1 Contact GRL at support@graniteriverlabs.com for support and quote@graniteriverlabs.com to request for a quote.
NIUSB-6501 for automatic toggling of Gen4 DUTs	Part Number: 779205-01 Discuss product recommendations, quote products, and place an order. <ul style="list-style-type: none"> Contact : + 91 80-4119 0000 Visit : www.ni.com/en-in/support/model.usb-6501.html
Other devices	<ul style="list-style-type: none"> SMP-SMA cables TCA-SMA connectors Matched pair cables

Differential probes

P7513, P7513A, P7516, P7520A, P7625, P7630, P7633, P7713, P7716, P7720 with respective tips

PCI Express						
Speed	Minimum oscilloscope bandwidth	TCA-SMA (Max 18 GHz)	TCA-292D (Max 33 GHz)	P7500 (Max 20 GHz)	P7700 (Max 20 GHz)	P7600 (Max 33 GHz)
2.5 GT/s	6 GHz	√	√	√	√	√
5.0 GT/s	12.5 GHz	√	√	√	√	√
8.0 GT/s	13 GHz	√	√	√	√	√
16.0 GT/s	25 GHz		√			√
32.0 GT/s	50 GHz		√			
100 MHz RefClk	5 GHz	√	√	√	√	√

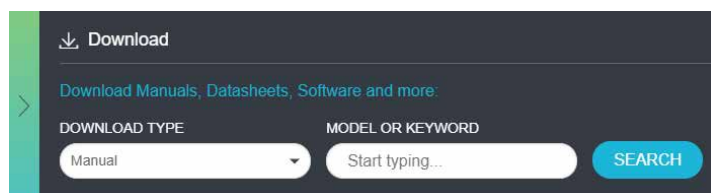
Software requirements

Downloading and installing the software

Complete the following steps to download and install the latest TekExpress PCI Express 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**.

⁸ DUT power cycle is supported for Add-In-Card DUT type only



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 PCI Express`.

5. Select **Application > TekExpress PCI Express** 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**.

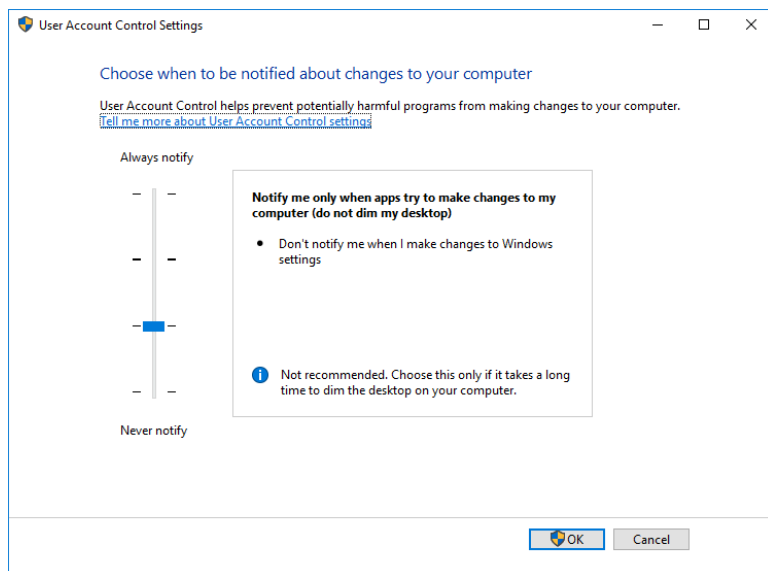


Setting up the test environment

Windows 10 user account settings

Windows 10 instruments need to have the User Account Control Settings set to **Never Notify**. To set User Account Control Settings:

1. Go to **Control Panel > User Accounts > Change User Account Control settings**.
2. Set the sliding control to **Always notify** as shown in the image, and click **OK**.



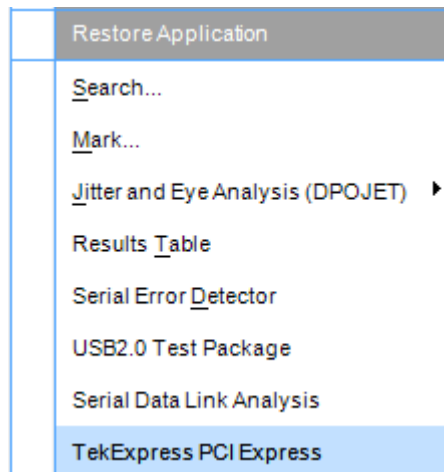
See also

[Instruments and accessories required](#) on page 14

Install the software

Use the following steps to install PCI Express software on any compatible instrument running Microsoft Windows 10 (64-bit). See [Minimum System Requirements](#) for details.

1. Close all applications (including the TekScope application).
2. Go to the www.tek.com Web site and search for TekExpress PCI Express to locate the installation file. Download the file `TekExpress_PCIE_Deployment_Package.exe`.
3. Copy or download the PCIe installer file to the oscilloscope.
4. Double-click the installer .exe file to extract the installation files and start the InstallShield Wizard. Follow the on-screen instructions. The software installs in the following location:
`C:\Program Files\Tektronix\TekExpress\TekExpress PCI Express`
5. The installer updates the TekScope Analyze menu to include the installed options.



See also

[Minimum system requirements](#)

[Instruments and accessories required](#) on page 14

Set application file permissions

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 start TekExpress PCIe, it creates the following folders on the oscilloscope:

- \My Documents\My TekExpress\PCI Express
- \My Documents\My TekExpress\PCI Express\Untitled Session

Every time you start TekExpress PCIe, an `Untitled Session` folder is created in the `PCIe` folder. The `Untitled Session` folder is automatically deleted when you exit the `PCIe` application. To preserve your test session files, save the test setup before exiting the TekExpress application.

CAUTION:



Do not modify any of the session files or folders because this may result in loss of 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 that contains associated files, is created on the oscilloscope X: drive.

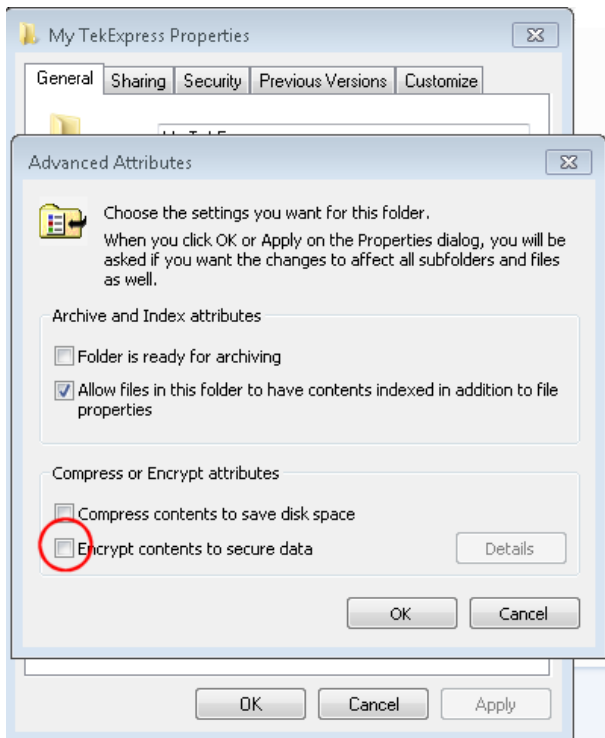
2. Map the shared My TekExpress folder as **X:** (X drive) on the instruments used in test setups running Microsoft Windows Operating System.

The My TekExpress folder has the share name format `<domain><user ID>My TekExpress`. Or, if the instrument is not connected to a domain, 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 (Drive X:) has read and write access:
 - 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 (not checked).



4. See the [prerun checklist](#) before you run a test.

See also

[Configuration: Set measurement limits for tests](#)

[Application directories](#)

[File name extensions](#)

About setting up tests

Set up tests using the tabs in the [Setup panel](#). 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.

Tests are saved when you save a test setup. To avoid overwriting test results, remember to assign a unique name to the test either before running it or immediately after.

See also

[Test setup overview](#) on page 23

[Before you click start](#)

[About running tests](#)

Equipment connection setup

Click the **Setup > Test Selection > Schematic** button to open a PDF file that shows the compliance test setup diagrams (instrument, DUT, and cabling) for supported testing configurations.

See also

Minimum system requirements

About setting up tests

Equipment connection setup through switch system

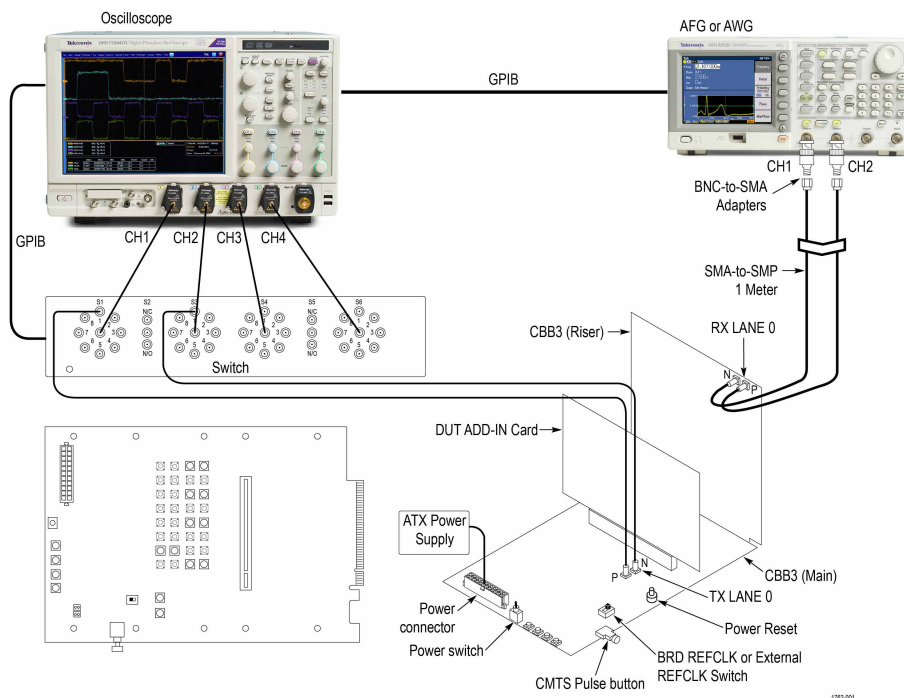


Figure 1: Add-In card connection setup through switch system

Switch: DUT Lane to Signal connection mapping			
TX LANE 0 P	S1 (relay) > Signal 1	TX LANE 0 N	S3 > Signal 1
TX LANE 1 P	S1 > Signal 2	TX LANE 1 N	S3 > Signal 2
TX LANE 2 P	S1 > Signal 3	TX LANE 2 N	S3 > Signal 3
TX LANE 3 P	S1 > Signal 4	TX LANE 3 N	S3 > Signal 4
TX LANE 4 P	S1 > Signal 5	TX LANE 4 N	S3 > Signal 5
TX LANE 5 P	S1 > Signal 6	TX LANE 5 N	S3 > Signal 6
TX LANE 6 P	S1 > Signal 7	TX LANE 6 N	S3 > Signal 7
TX LANE 7 P	S1 > Signal 8	TX LANE 7 N	S3 > Signal 8
TX LANE 8 P	S4 > Signal 1	TX LANE 8 N	S6 > Signal 1
TX LANE 9 P	S4 > Signal 2	TX LANE 9 N	S6 > Signal 2

Table continued...

Switch: DUT Lane to Signal connection mapping			
TX LANE 10 P	S4 > Signal 3	TX LANE 10 N	S6 > Signal 3
TX LANE 11 P	S4 > Signal 4	TX LANE 11 N	S6 > Signal 4
TX LANE 12 P	S4 > Signal 5	TX LANE 12 N	S6 > Signal 5
TX LANE 13 P	S4 > Signal 6	TX LANE 13 N	S6 > Signal 6
TX LANE 14 P	S4 > Signal 7	TX LANE 14 N	S6 > Signal 7
TX LANE 15 P	S4 > Signal 8	TX LANE 15 N	S6 > Signal 8

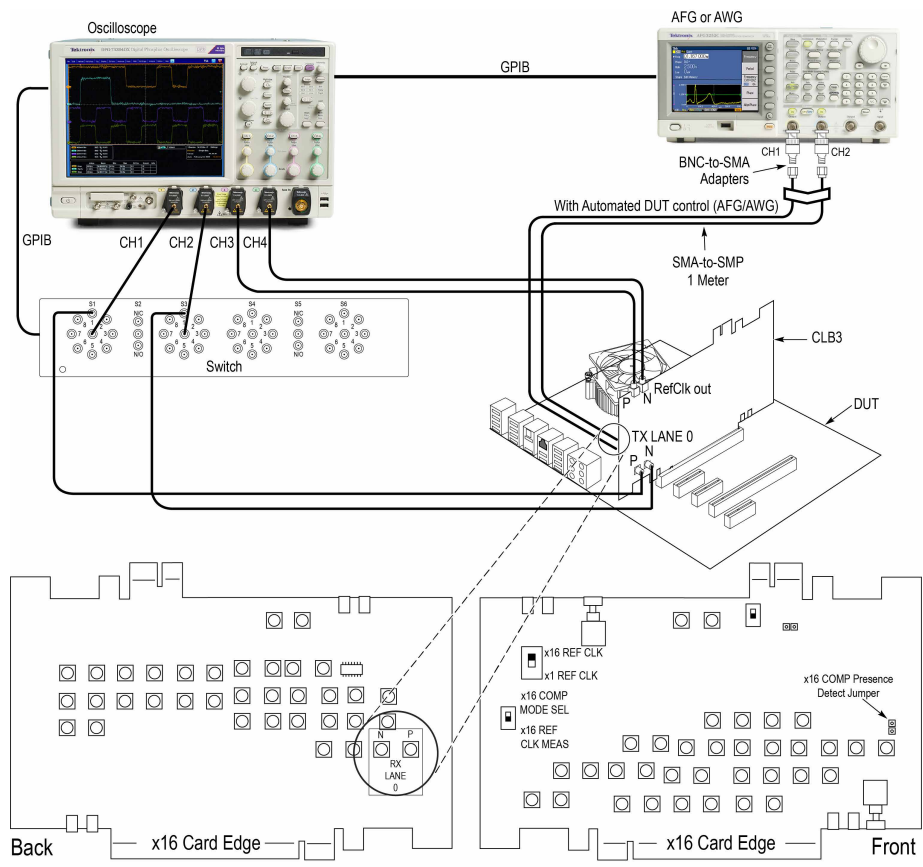


Figure 2: System board (normal) connection setup through switch system

Switch: DUT Lane to Signal connection mapping			
TX LANE 0 P	S1 (relay) > Signal 1	TX LANE 0 N	S3 > Signal 1
TX LANE 1 P	S1 > Signal 2	TX LANE 1 N	S3 > Signal 2
TX LANE 2 P	S1 > Signal 3	TX LANE 2 N	S3 > Signal 3

Table continued...

Switch: DUT Lane to Signal connection mapping			
TX LANE 3 P	S1 > Signal 4	TX LANE 3 N	S3 > Signal 4
TX LANE 4 P	S1 > Signal 5	TX LANE 4 N	S3 > Signal 5
TX LANE 5 P	S1 > Signal 6	TX LANE 5 N	S3 > Signal 6
TX LANE 6 P	S1 > Signal 7	TX LANE 6 N	S3 > Signal 7
TX LANE 7 P	S1 > Signal 8	TX LANE 7 N	S3 > Signal 8

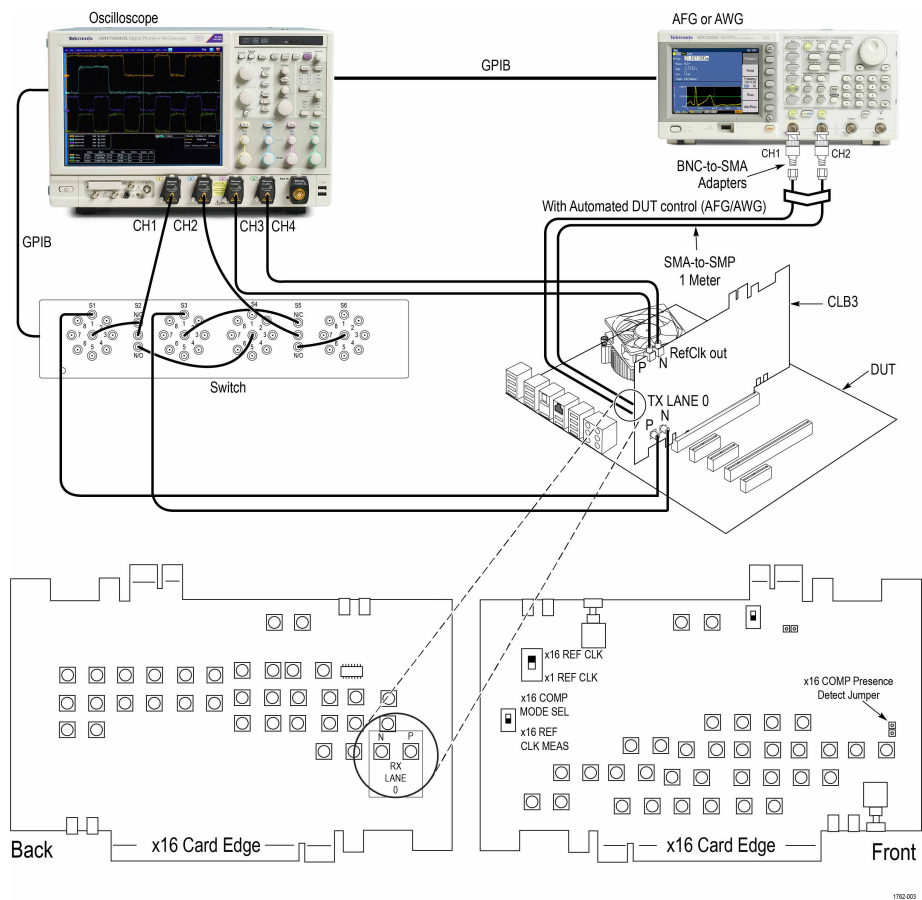


Figure 3: System board (cascade) connection setup through switch system

Switch: DUT Lane to Signal connection mapping			
TX LANE 0 P	S1 (relay) > Signal 1	TX LANE 0 N	S3 > Signal 1
TX LANE 1 P	S1 > Signal 2	TX LANE 1 N	S3 > Signal 2
TX LANE 2 P	S1 > Signal 3	TX LANE 2 N	S3 > Signal 3
TX LANE 3 P	S1 > Signal 4	TX LANE 3 N	S3 > Signal 4

Table continued...

Switch: DUT Lane to Signal connection mapping			
TX LANE 4 P	S1 > Signal 5	TX LANE 4 N	S3 > Signal 5
TX LANE 5 P	S1 > Signal 6	TX LANE 5 N	S3 > Signal 6
TX LANE 6 P	S1 > Signal 7	TX LANE 6 N	S3 > Signal 7
TX LANE 7 P	S1 > Signal 8	TX LANE 7 N	S3 > Signal 8
TX LANE 8 P	S4 > Signal 1	TX LANE 8 N	S6 > Signal 1
TX LANE 9 P	S4 > Signal 2	TX LANE 9 N	S6 > Signal 2
TX LANE 10 P	S4 > Signal 3	TX LANE 10 N	S6 > Signal 3
TX LANE 11 P	S4 > Signal 4	TX LANE 11 N	S6 > Signal 4
TX LANE 12 P	S4 > Signal 5	TX LANE 12 N	S6 > Signal 5
TX LANE 13 P	S4 > Signal 6	TX LANE 13 N	S6 > Signal 6
TX LANE 14 P	S4 > Signal 7	TX LANE 14 N	S6 > Signal 7
TX LANE 15 P	S4 > Signal 8	TX LANE 15 N	S6 > Signal 8



Note: GPIB is the recommended interface to execute the switch matrix commands.

Test setup overview

Test setup includes acquisition and configuration parameters. You can also select report options when setting up tests. Use the options in the [Setup panel](#) and [Reports panel](#) to select and configure tests.

1. [Set up equipment.](#)
2. [Do the prerun checklist.](#)
3. [Set DUT parameters.](#)
4. [Select one or more tests.](#)
5. [Select acquisitions.](#)
6. [Configuration test parameters.](#)
7. [Set test measurement notification options.](#)
8. [Select report options.](#)

See also

[About test setups](#)

[Before you click start](#)

[About running tests](#)

Prerequisite

Compensate the signal path

Use the following procedure to compensate the internal signal acquisition path. Perform this procedure if the ambient temperature has changed more than 5 °C (9 °F) since you performed the last signal path compensation. Perform the signal path compensation once a week. Failure to do so may result in the instrument not meeting warranted performance levels.

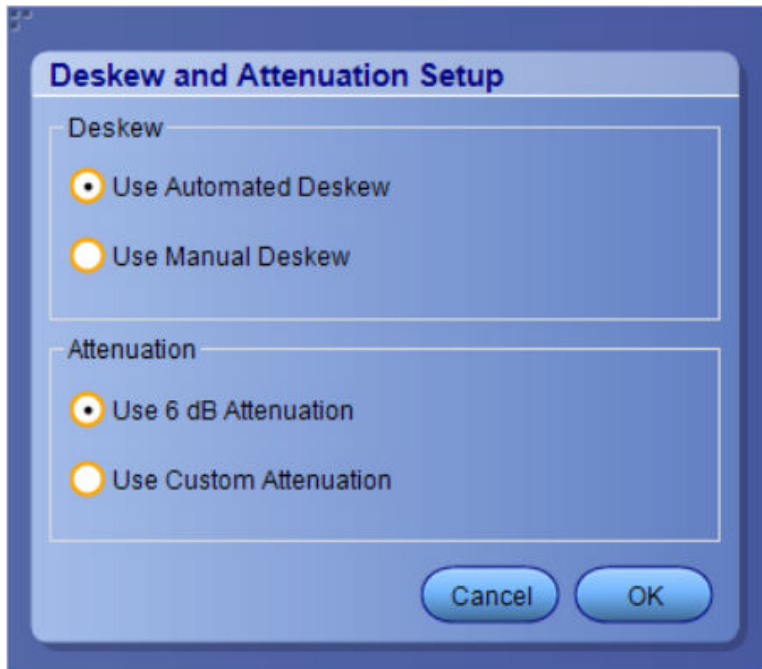
1. Power on and wait for the instrument to complete its warm up period before continuing with this procedure.
2. Disconnect any probes you have connected to the input channels.
3. Set the instrument to Menu mode.
4. Select Instrument Calibration from the Utilities menu.
5. Note any instructions that appear in the resulting control window.
6. Click Run SPC to begin the procedure. The procedure may take several minutes to complete.
7. Verify that the Status changes to Compensated after the procedure is complete. If the Calibration Status field indicates anything other than Compensated, see Signal Path Compensation Status for information on the readout and recommended action.



Note: When making measurements at vertical scale settings less than or equal to 5 mV, you should perform the signal path compensation at least once a week. Failure to do so may result in the instrument not meeting warranted performance levels at those volts/div settings.

Deskew and Attenuation

By clicking on the button opens up the Deskew and Attenuation Setup window which has the following options.



Deskew:

1. **Use Automated Deskew** (Which is selected by default) automated deskew works in the following way:
 - By selecting the automated deskew, the application runs the deskew operation before acquiring the DUT signal.
 - Deskew will be performed to remove the skew of the setup which is primarily the cable set and oscilloscope channel. Deskew requires a low-frequency signal with a small rise/fall time. Both these requirements are fulfilled by the fast edge on the oscilloscope.

- During deskew the other end of the cable connected to the fixture/ISI board is connected to the fast edge. Fast edge has a skew of less than 1 ps. If the +ve and -ve channels of fast edge are phase-matched, the user can ensure that the setup (cable+oscilloscope channel) has a skew of less than 1 ps.

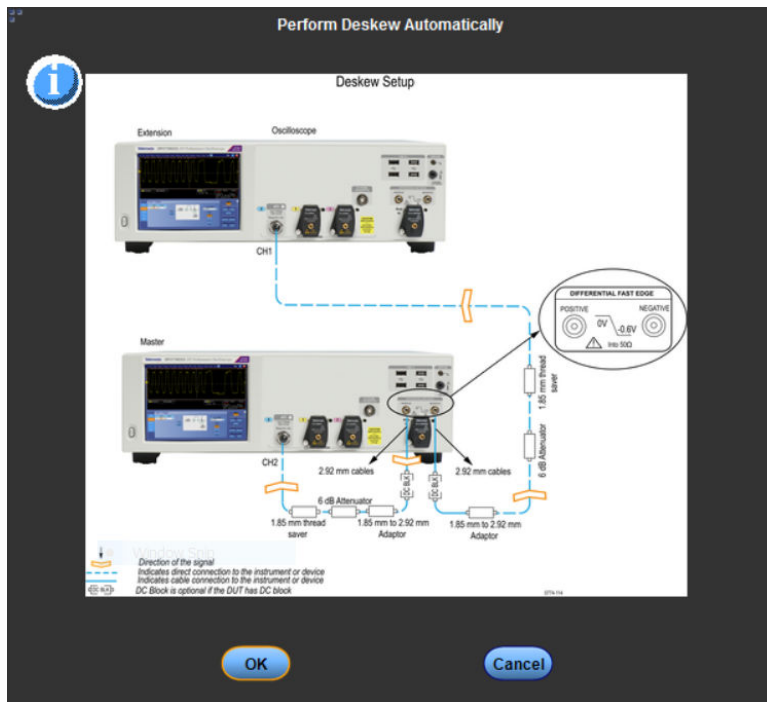
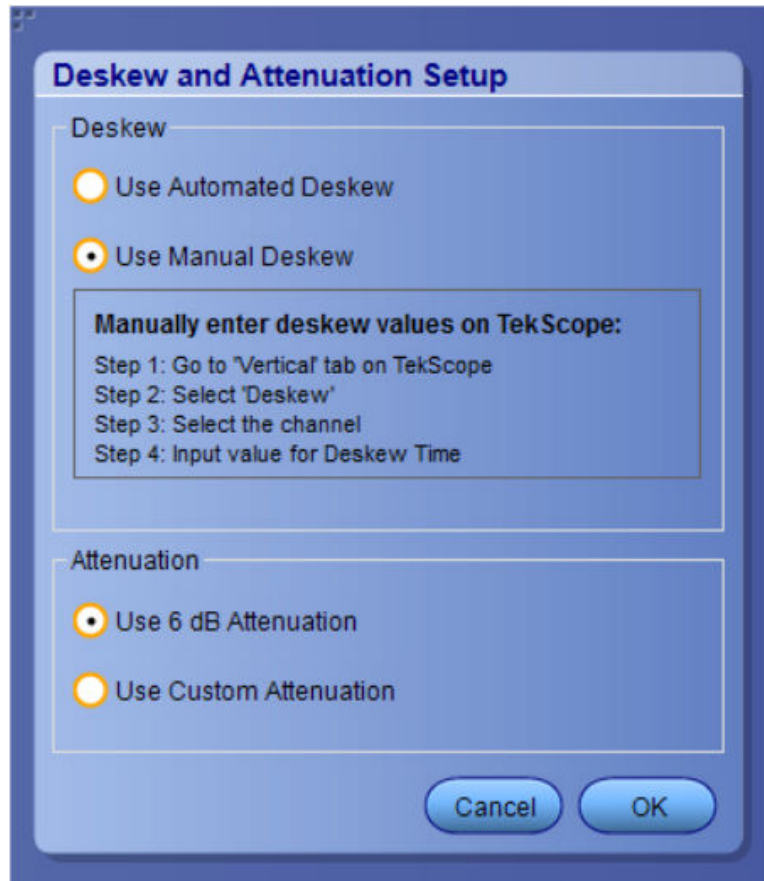
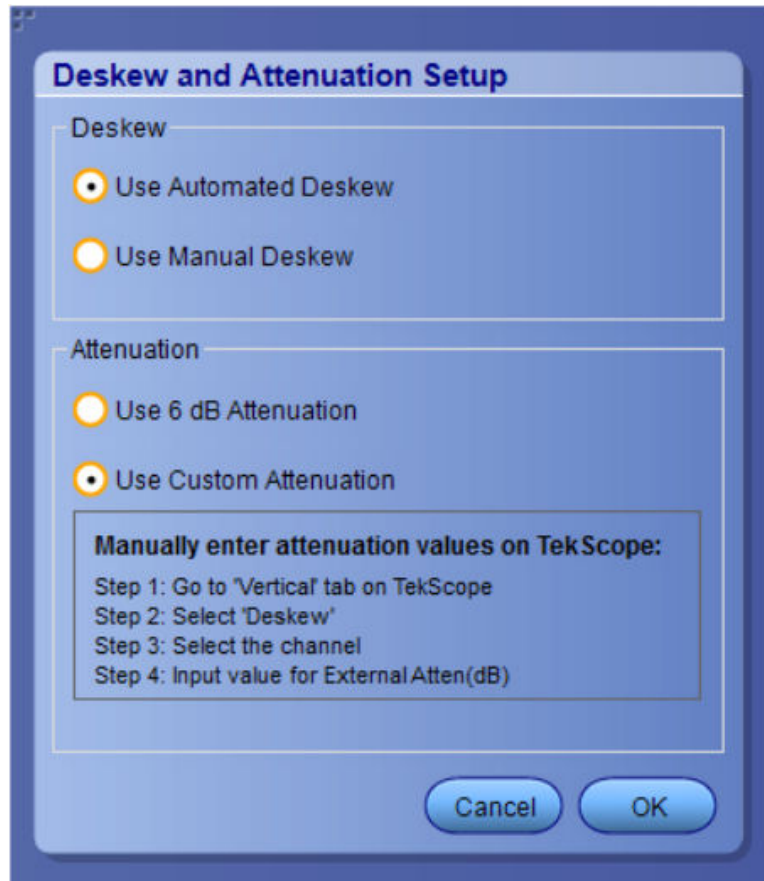


Figure 4: Deskew popup window

2. Use Manual Deskew Manual

**Attenuation:**

1. **Use 6 dB Attenuation** (Which is selected by default).
2. **Use Custom Attenuation.**



Running tests

After selecting and configuring tests, review the [Prerun checklist](#) and then click **Start** to run the tests. While tests are running, you cannot access the Setup or Reports panels. To monitor the test progress, switch back and forth between the Status panel and the Results panel.

The application 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 by using the **Alt + Tab** key combination. To keep the TekExpress PCIe application on top, select **Keep On Top** from the TekExpress Options menu.

See also

[Before you click start](#)

[About configuring tests](#)

[About setting up tests](#)

Prerun 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 Signal Path Compensation (SPC):
 - a. On the oscilloscope main menu, select the **Utilities** menu.
 - b. Select **Instrument Calibration**.

3. Verify that the application is able to find the DUT. If it cannot, perform a search for connected instruments:
 - a. In PCIe, select the **Setup** panel and then click the **Test Selection** tab.
 - b. Select any test and then click **Configure**.
 - c. In the Configuration section, click **Global Settings**.
 - d. In the **Instruments Detected** section, click the drop-down arrow to the right of **Real Time Scope** and make sure that the oscilloscope with the (GPIB8::1::INSTR) designation is in the list.

See also

[Equipment connection setup](#)

Search instruments connected to the application

Use the TekExpress Instrument Control Settings dialog box to search the instruments (resources) connected to the application. The application uses TekVISA to discover the connected instruments.

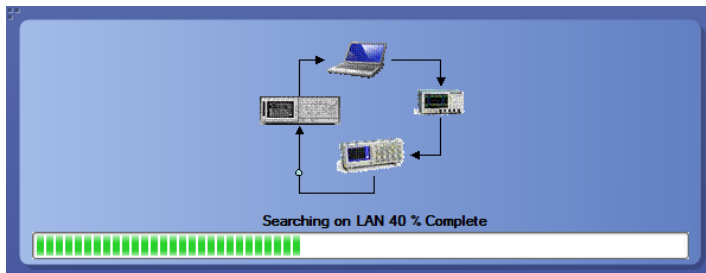


Note: The instruments required for the test setup must be connected and detected by the application, before running the test.

To refresh the list of connected instruments:

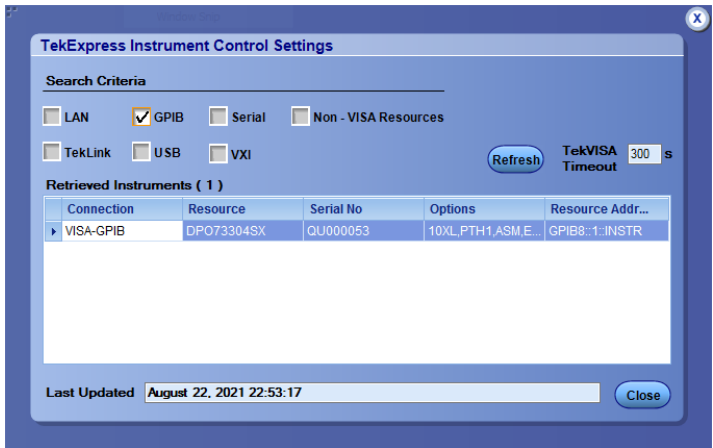
1. Select **Options > Instrument Control Settings**.
2. In the **Search Criteria** section of the **Instrument Control Settings** dialog box, select the connection types of the instruments to search. Instrument search is based on the VISA layer, but different connections determine the resource type, such as LAN, GPIB, and USB. For example, if you choose LAN, the search will include all the instruments supported by the TekExpress that are communicating over the LAN.
3. Click **Refresh**. The TekExpress application searches for the connected instruments.

Search status of the instruments connected to LAN



4. When the search is complete, a dialog box lists the instrument-related details based on the search criteria. For example, for the Search Criteria as GPIB, the application displays all the GPIB instruments connected to the application.

TekExpress Instrument Control Settings window.



The details of the instruments are displayed in the Retrieved Instruments table. The time and date of instrument refresh is displayed in the Last Updated field.

Starting the application

To start the TekExpress PCI Express, select from the oscilloscope menu bar. **Applications > TekExpress PCI Express**

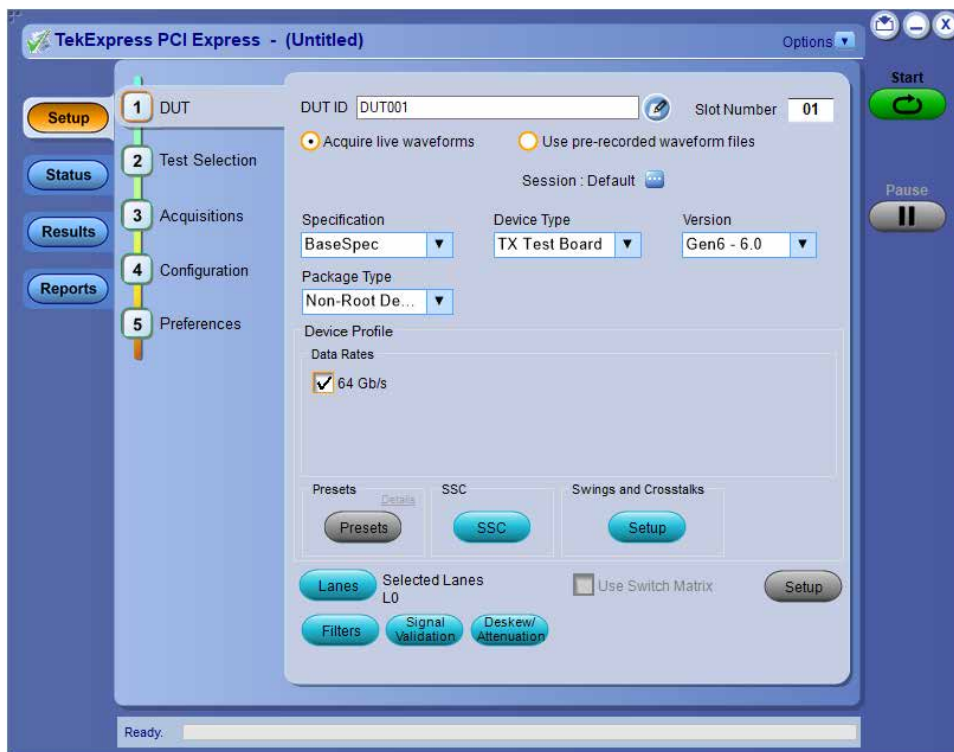


Figure 5: TekExpress PCI Express application start screen (with ATI Mode)

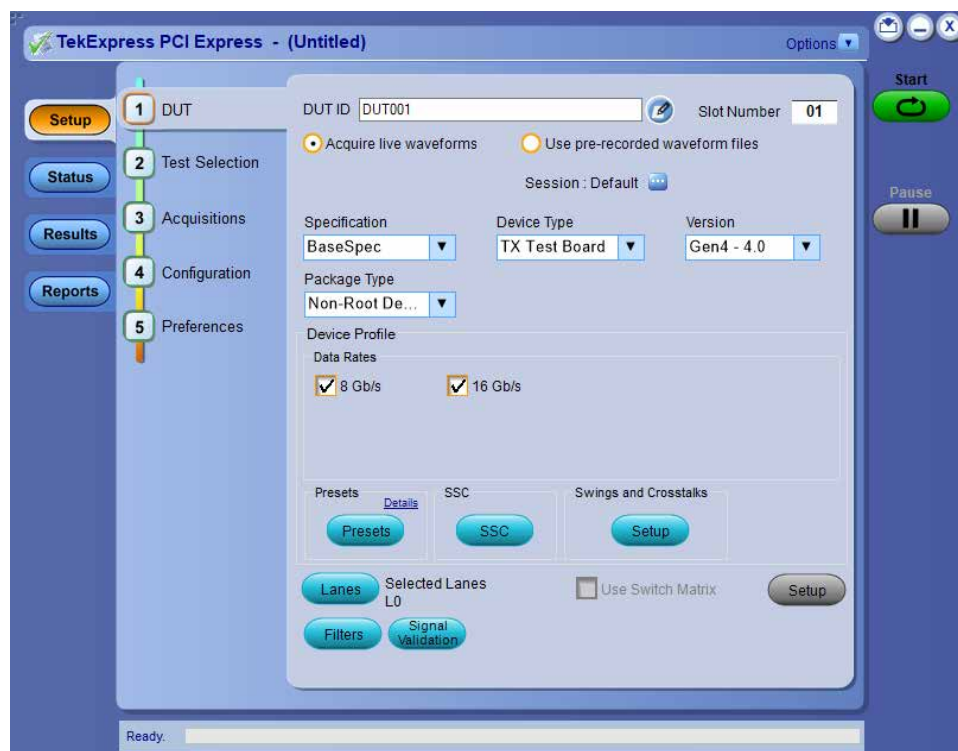


Figure 6: TekExpress PCI Express application start screen (Non-ATI Mode)


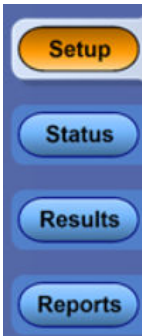








During start, a "My TekExpress" folder is created in the Documents folder of the current user and gets mapped to "X" drive. When the application is closed properly, the "X" drive gets unmapped. Session files are then stored inside the X:\PCI Express folder. If this file is not found, the application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

To keep the TekExpress PCI Express 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 PCI Express** to bring the application to the front.

Application controls

This section describes the application controls with functionality and its details.

Table 5: 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 	<p>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.</p> <p> Note: This button is visible only when there are results data on the panel.</p>
Application window move icon 	Place the cursor over the top of the application window to move the application window to the desired location
Minimize icon 	Minimizes the application.
Close icon 	Close the application.
Table continued...	

Item	Description
Mini view / 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:

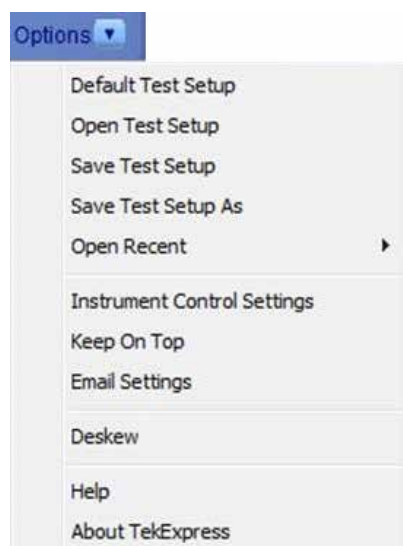


Table 6: Options menu settings

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.
<i>Instrument Control Settings</i>	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 PCI Express application on top of all the applications.
<i>Email Settings</i>	Configures email options for test run and result notifications.
Deskew	Loads oscilloscope channel deskew settings into the application.
Help	Displays the TekExpress PCI Express help.

Table continued...

Menu	Function
About TekExpress	Displays the application name, version, and hyperlink to end the user license agreement.

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 7: TekExpress Instrument Control Settings window



See also

[Options menu functions](#) on page 33

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 8: Email settings window

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

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

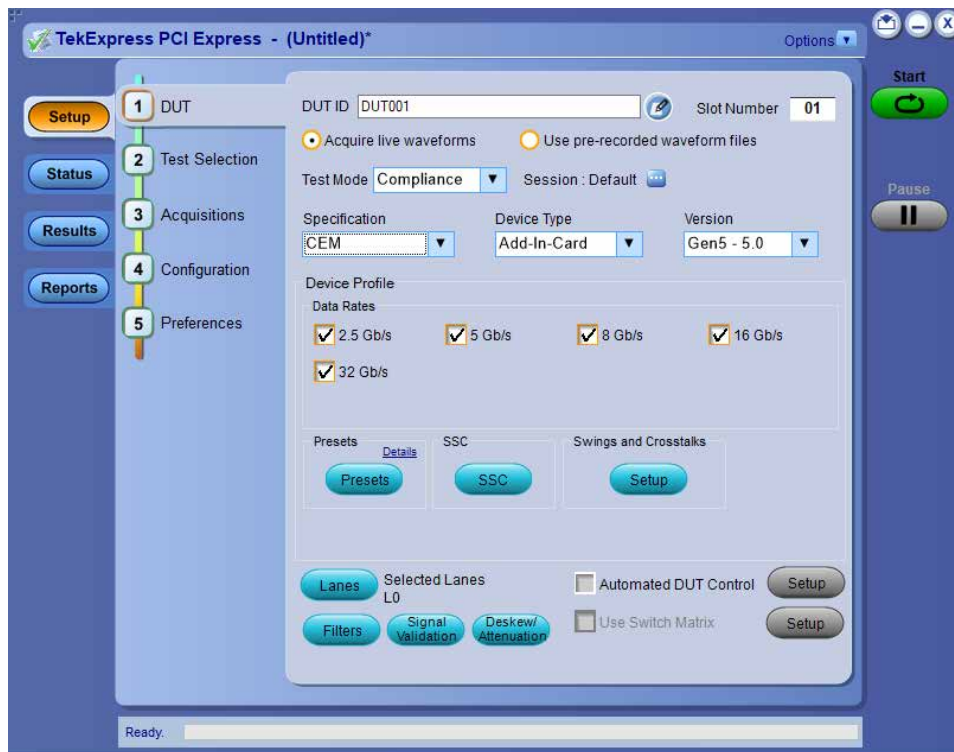


Note: If any of the above required fields are left blank, the settings will not be saved, and email notifications will not be sent.

5. In the **Email Attachments** section, select from the following options:
 - **Reports:** Select to receive the test report with the notification email.
 - **Status Log:** Select to receive the test status log with the notification email. If you select this option, then also select whether you want to receive the full log or just the last 20 lines.
6. In the **Email Configuration** section:
 - Enter a maximum file size for the email message. Messages with attachments larger than this limit will not be sent. The default is 0 MB.
 - Enter the number in the Number of Attempts to Send field, to limit the number of attempts that the system makes to send a notification. The default is 1. You can also specify a timeout period.
7. Select the **Email Test Results When complete or on error** check box. Use this check box to quickly enable or disable email notifications.
8. To test your email settings, click **Test Email**.
9. To apply your settings, click **Apply**.
10. Click **Close** when finished.

Setup panel: Configure the test setup

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



DUT: Set DUT settings

Use the DUT tab to select parameters for the device under test. These settings are global and apply to all tests of current session. DUT settings also affect the list of available tests in the Test Selection tab.

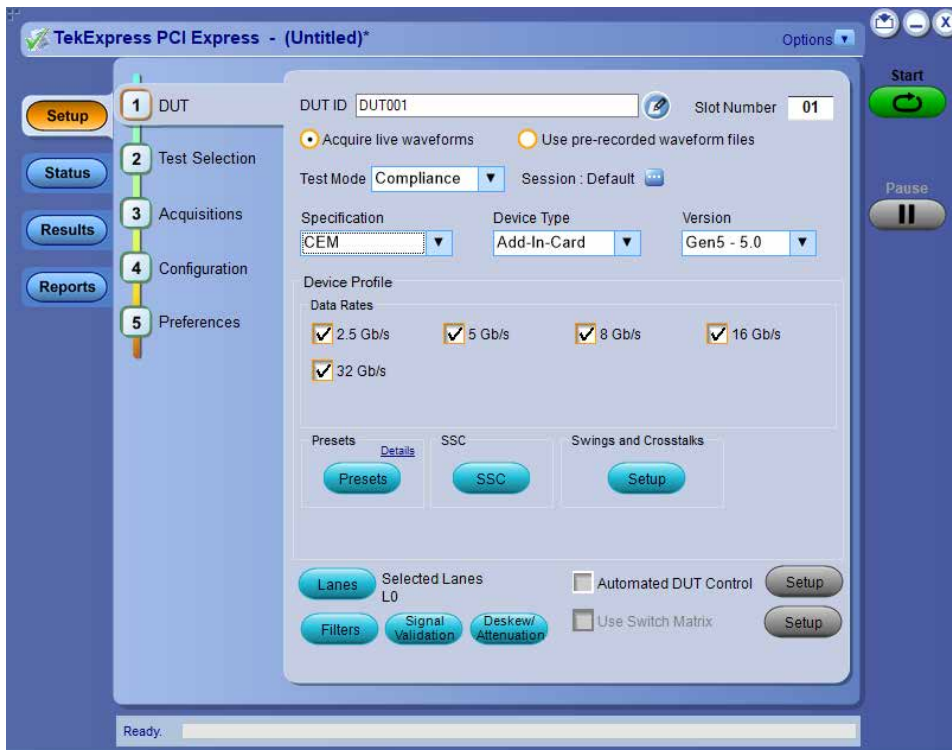


Figure 9: TekExpress PCI Express: DUT tab

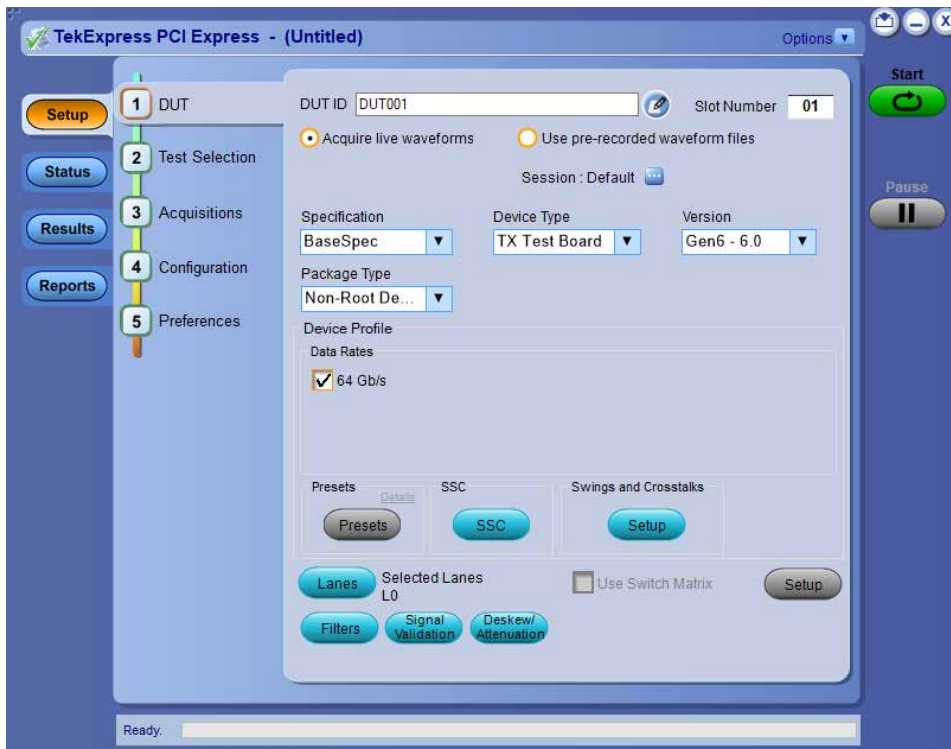


Figure 10: TekExpress PCI Express: DUT Tab - Base Gen6

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

Table 7: DUT tab configuration



Setting	Description
DUT ID	Adds an optional text label for the DUT to reports. The default value is DUT001 ⁹ .
Slot Number	The slot parameter (1, 2, 4, 8, 16, or 32) of the DUT.
 Comments icon (to the right of the DUT ID field)	Opens a Comments dialog box in which to enter optional text to add to a report. The maximum number of characters is 256. To enable or disable comments appearing on the test report, refer View a generated report .
Acquire live waveforms	Acquire active signals from the DUT for testing.
Use prerecorded waveform files	Run tests on a saved waveform. Load a saved test setup
Test Mode	Sets the overall testing mode. Select Compliance or User Defined: <ul style="list-style-type: none"> Compliance: Preselects tests and parameters to meet compliance specifications for the selected version, specification, and device type. User Defined: Enables the user to select specific tests and set custom parameters for tests. <div>  Note: Not applicable for the <i>Device type / Specification type BaseSpec</i> </div>
Session	Allows you to save multiple config sessions and run multiple config/run sessions together.
Specification	PCIe supports the CEM, BaseSpec, RefClockSpec, U.2 (SFF-8639), and M.2 specification.

Table continued...

⁹ In pre-recorded mode, waveform recall will not be successful if the session name is lengthy, i.e. more than 10 characters.



Setting	Description
Device Type	<p>Sets the DUT device type. The device type available depends on the selected specification. Following are the device types for each specifications</p> <ul style="list-style-type: none"> • CEM: <ul style="list-style-type: none"> • Add-In-Card • System-Board • BaseSpec: <ul style="list-style-type: none"> • TX Test Board • SRIS TX Test Board • RefClockSpec: <ul style="list-style-type: none"> • Ref Clock • U.2 (SFF-8639): <ul style="list-style-type: none"> • Module • Host • M.2 <ul style="list-style-type: none"> • M2_Add-In-Card • M2_Host <p> Note: CXL device type support is newly added to the TekExpress PCIe TX application. Refer CXL Support for more details.</p>
Version	<p>Sets the DUT generation version. Available versions are:</p> <ul style="list-style-type: none"> • CEM: Gen 1 (1.0a and 1.1), Gen2 (2.0), Gen3 (3.0), Gen4 (4.0) and Gen5 (5.0) • Base Spec: Gen3 (3.0), Gen4 (4.0), Gen5 (5.0), and Gen6 (6.0) • RefClockSpec: Gen5(5.0) Supports all Gen1-5 Versions • U.2: Gen3 (3.0) • M.2: Gen3 (3.0) • CXL: Gen3 (3.0), Gen4 (4.0) and Gen5 (5.0)
Device Profile	
Data Rates	Sets the data rates to test (2.5 Gb/s, 5 Gb/s, 8 Gb/s, 16 Gb/s, 32 Gb/s, and 64 Gb/s). The data rates available depend on the selected DUT version.
Filters	Opens the Filter Setup dialog box to select custom filter files with which to perform link analysis on the source waveforms.
Presets	<p> Note: This settings is only available for Gen2, Gen3, Gen4, and Gen5 DUT versions.</p> <p>Opens the Presets dialog box. User can select Gen2 preemphasis and Gen3 to Gen5 presets(P0 to P10) for signal quality tests in respective tabs. All preemphasis and presets are selected by default. At least one preemphasis level/preset must be selected for each generation.</p>

Table continued...




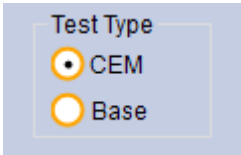

Setting		Description
		 
Swings and Crosstalks	Voltage Swing Limits	<p>Sets the lane/link transmitter p-p voltage swing.</p> <p>This affects the limits applied to certain measurements based on the settings and does not change anything on the DUT tab.</p>
	Crosstalk Limits	<p>Sets specific eye test limits depending on if the DUT design uses interleaved or non interleaved routing.</p> <p>This affects the limits applied to certain measurements based on the settings and does not change anything on the DUT tab. This is applicable for Gen2.</p> <ul style="list-style-type: none"> When the DUT uses noninterleaved routing, select Crosstalk (noninterleaved routing). When the DUT uses interleaved routing, select No Crosstalk (interleaved routing).
SSC (Spread Spectrum Clocking)		<p>Enables or disables SSC clocking.</p> <p>This affects the limits applied to certain measurements based on the settings and does not change anything on the DUT tab.</p>
Lanes		<p>Opens the Test Lane Setup dialog box to select the lanes to test. Lanes required for compliance testing are colored orange. At least one lane must be selected.</p> <p>The Link Width setting determines the number of lanes that can be tested.</p>
Automated DUT Control		<p>Enables automatic toggling of the DUT into different test modes (generation/equalization). Requires the use of an AFG or AWG or NI USB toggle tool. Click Setup to access the Automated DUT control setup</p>
Use Switch Matrix		<p>Select to use the switch matrix. This solution allows you to map each of the several transmitter signals and forward the selected input either to another relay or to the oscilloscope channel.</p>

Table continued...

Setting		Description
		<p>Click Setup to configure the switch matrix. Refer Switch Matrix application for more details on configurations.</p> <p>Note:</p>  <ul style="list-style-type: none"> Keithley supports maximum of 12 lanes and Gigatronics supports maximum of 16 lanes. Switch Matrix is applicable for Gen1, 2, 3 only.
Signal validation	Signal validation	Sets the application to validate acquisition signals and perform the specified action to take when acquired signals do not meet requirements. Select the action from the list.
	Perform Pattern Decoding	Select to validate the pattern according to the respective lane and preset for Gen3.
Deskew/Attenuation		<p>Provides the option of setting deskew and attenuation values on the scope either in an automated way or manual way.</p> <p>Refer Deskew and Attenuation for more details.</p>
Test Type		<p>Use this procedure to choose between CEM or Base type of Ref Clock testing.</p>  <p>Note:  This is only available for Ref Clock testing and the measurement limits will be changed based on this setting.</p>

Filter setup dialog box

The filter setup dialog box lets you select custom filter files for performing link analysis on the source waveforms. The options available depends on the Specification selected.



Figure 11: Filter Setup for Gen6 BaseSpec

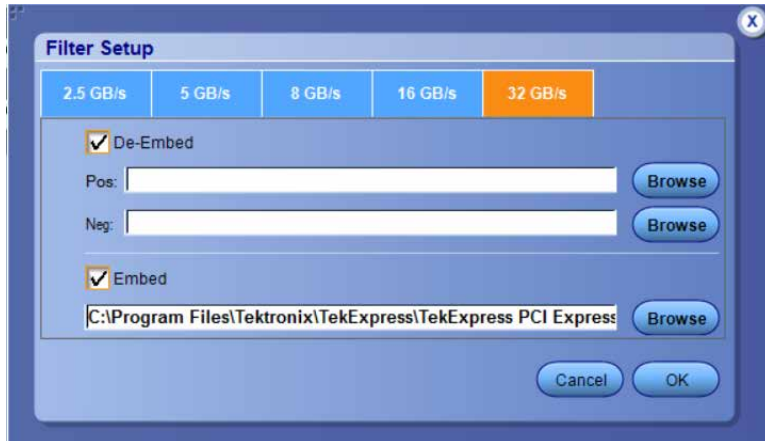


Figure 12: Filter Setup for Gen1-5 CEM

De-Embed

Select de-embed for the data rate; click **Browse** and select the de-embed filter file.

Note:



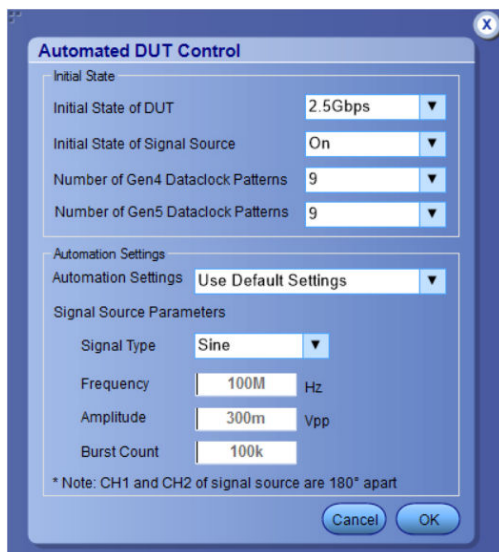
- For 32 GB/s single ended probe in ATI Mode, select 2 de-embed filter files for positive and negative data respectively. For differential probe, select same filter file for both positive and negative data.
- 32 GB/S filter files should be created with 200 GS/s sample rate and 33 GHz bandwidth.





Embed

Select Embed for the data rate; click **Browse** and select the embed filter file.

Automated DUT control setup

The Automated DUT Control dialog box sets the parameters needed for automatic toggling of the DUT into different test modes (generation/equalization). DUT automation requires the use of a signal source AFG or AWG or NI USB toggle.



Parameter	Description
Initial State	
Initial State of DUT	Sets the starting state of the DUT.
Initial State of Signal Source	Sets the AFG/AWG state to On (default) or Off . The On state enables the AFG/AWG output before the application starts signal acquisition. Some DUTs will toggle to the next signal state when the AFG/AWG initial state is On. Set the initial state to Off for these types of DUTs before running automated tests.
Number of Gen4 Dataclock patterns	Allows to select the number of Gen4 dataclock patterns the DUT supports, between 0 to 15.  Note: The dataclock pattern is selected as 9 by default.
Number of Gen5 Dataclock patterns	Allows to select the number of Gen5 dataclock patterns the DUT supports, between 0 to 15.  Note: The dataclock pattern is selected as 9 by default.
Automation Settings	
Automation Settings (for AFG only)	The Automation Settings values are as follows : <ul style="list-style-type: none"> • Use Default Settings: The signal source parameters are set to predefined values as recommended by the test specification. The signal source parameter fields are disabled and cannot be edited. • Manually Configure Settings: The signal source parameters are set directly at the AFG. The signal source parameter fields are disabled and cannot be edited. The PCIe application turns on or off the signal source without changing the settings. • Use Custom Settings: The signal source parameters are set to the values specified in the Signal Source Parameters area. The signal source parameter fields are enabled.
Signal Source Parameters	
Signal Type	Valid signal types are Sine and Square .
Frequency	Sets the AFG to output the specified frequency and amplitude values.
Amplitude	
Burst Count	Sets the AFG to output the specified signal burst count.  Note: Ch 1 and Ch 2 on the AFG source are set to 180° phase difference in all modes except Manually Configure Settings.  Note: Using DC Caps or Manual toggle, you can eliminate the automatic toggling issues that is due to DC offset.

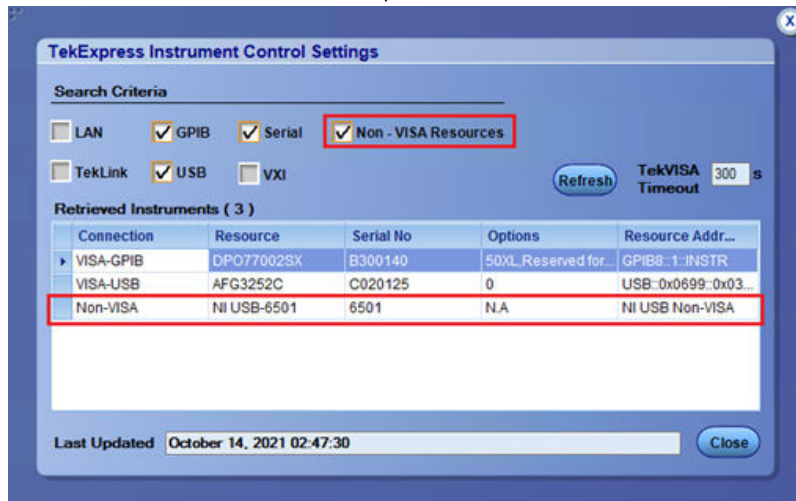
NI USB 6501 DUT Controller Support

The following information provides how to use NI USB 6501 DUT Controller Support.

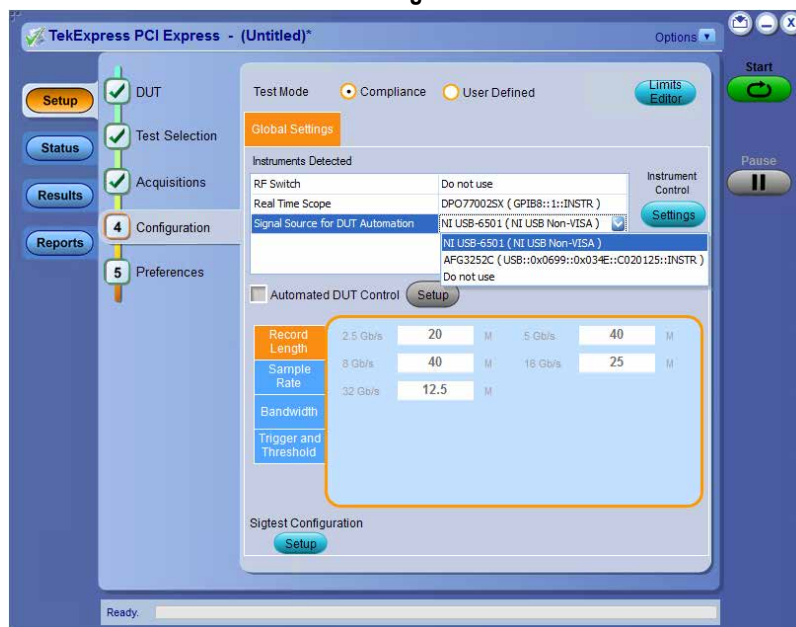
- TekExpress PCIe TX application added support for National Instrument USB-6501 CBB controller device in TekExpress PCIe Express TX application. This device can be used to toggle the DUT.
- In order to detect the hardware and access it, the user will have to install the NI-DAQMX v20.7.1 software package in the Tekscope.

Steps to setup NI USB 6501 device in TekExpress:

1. Go to Configuration Panel.
2. Click on the **Instrument Control Settings** button.
3. In the **TekExpress Instrument Control Settings** pop-up window, check **Non-VISA Resources** and then click the **Refresh** button.
4. If the NI device is connected to the scope, it will be shown in the **Retrieved Instruments**.

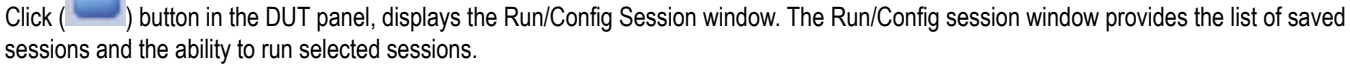


5. Close the pop-up window.
6. The device now can be selected under **Signal Source for DUT Automation**.



Multiple-session run

Multiple-sessions run feature allows you to save multiple config sessions and run multiple config/run sessions together.



- Run/Config Sessions**

<input type="checkbox"/>	Session	DUTID	Comment
<input checked="" type="checkbox"/>	20210607_232739	DUT001	DUT001
<input type="checkbox"/>	20210607_232834	DUT001	DUT001

Session Name (Max:40)

- ## Enable/ Disable the Multi Run session

Test Selection: Select the tests

Use the Test Selection tab to select the tests. The test measurements available depends on the settings selected in the DUT tab.

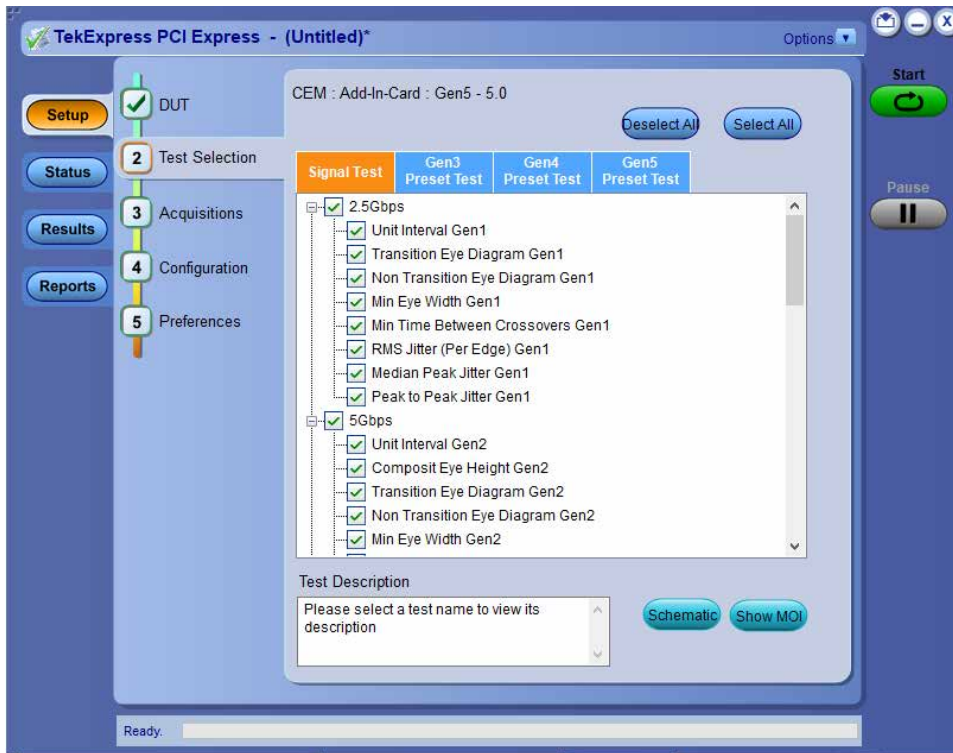


Figure 13: Test selection tab

Table 8: Test Selection tab configuration

Setting	Description
Signal Tests	Click + to expand a group of commands. Click the check box adjacent to a test group to select all tests in that group. Click check boxes adjacent to individual tests to select those tests.
Deselect All	Click Deselect All button to deselect all tests.
Select All	Click Select All button to select all tests.
Show MOI	Click Show MOI button to open the MOI (Methods of Implementation) document for all measurements.
Schematic	Click Schematic button to view a diagram that shows the correct DUT and equipment setup for the selected test. Use to verify your test equipment setup before running the test.
Gen3, Gen4, and Gen5 testing	Click the required Preset Test tab and select the presets tests.
Lanes	Click the Lanes button in the Preset Test tab to view and select which lanes to use for preset testing. At least one lane must be selected.

Acquisitions: Set waveform acquisition settings

Use the **Acquisition** tab in the Setup panel to view and select test acquisition parameters, including the signal source channels, acquisition options, and waveform save options. This panel also shows the signal inputs required for the selected DUT parameters.

Contents displayed on this tab depend on whether you acquire active waveforms or use prerecorded waveform files (as set in the **DUT** tab). Contents displayed on this tab also depend on detected probes and the specified DUT type.

Active waveforms

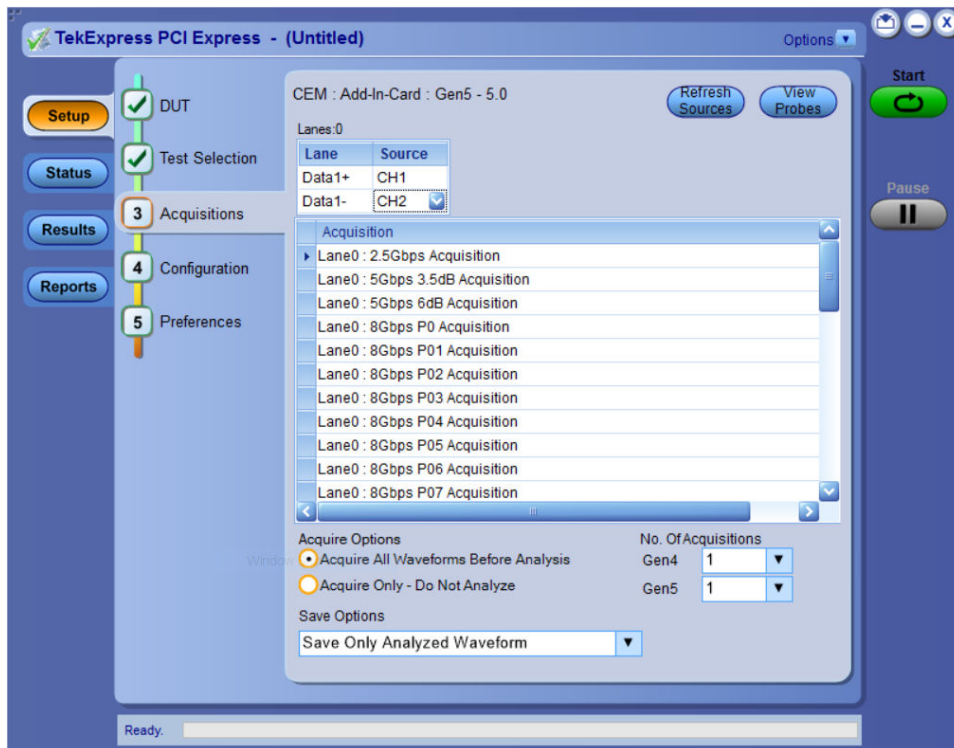


Figure 14: Acquisitions tab: using active waveforms (with ATL channels)

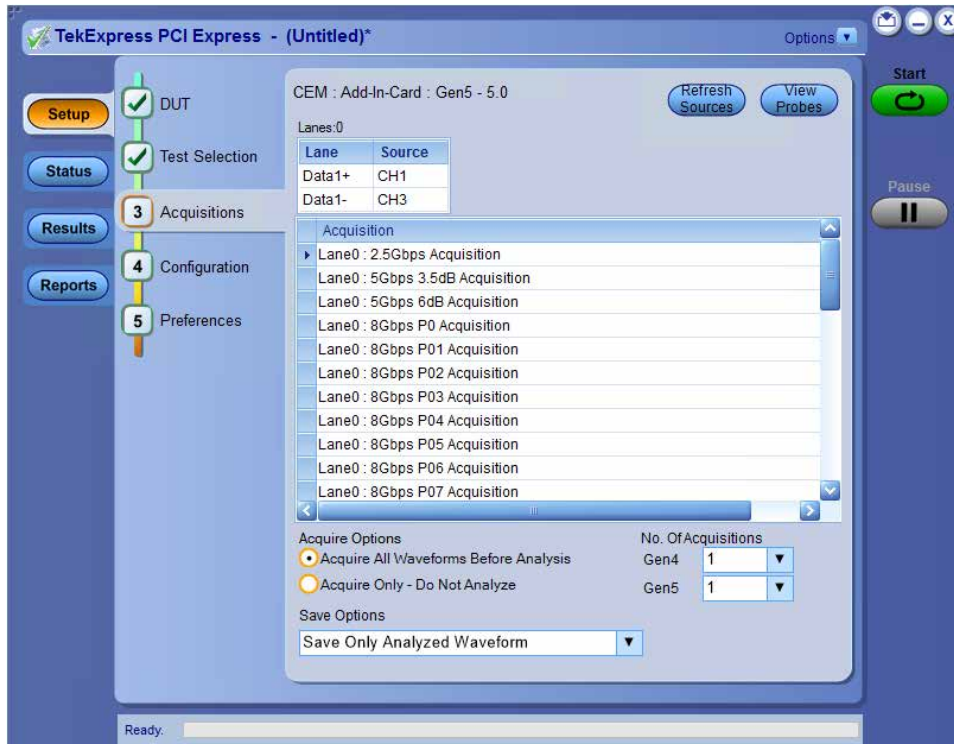


Figure 15: Acquisitions tab : using active waveforms (with Non-AT1 channels)

Table 9: Acquisitions tab configuration


Setting	Description
Source Selection	Click the Source fields to select signal sources for the listed lanes. The number of lanes shown depends on the parameters set in the DUT tab.
Refresh Sources	Click Refresh Sources to refresh the probe configuration after changing any probes. (This button performs the same function as the Refresh button in the Probe Configuration dialog box.)
View Probes	Click View Probes to view the detected probe configuration. Use the View Probes dialog box to enable or disable probe signal source access in the application. <div data-bbox="812 1413 1364 1743" data-label="Image"> </div> <div data-bbox="812 1764 1429 1837" data-label="Text"> <p> Note: Only Differential option is available under Probe Method for Trimode probes.</p> </div>

Table continued...

Setting	Description
Acquire Options	Click the Acquire Options controls to set how the application acquires and analyzes signals.
Save Options	Click the Save Options field to set how the application saves acquired waveforms (save all waveforms, save all waveforms after applying filters, or discard all waveforms after running analysis).
No. of Acquisitions	Select the No. of acquisition for Gen4 from the drop-down.

Prerecorded waveforms

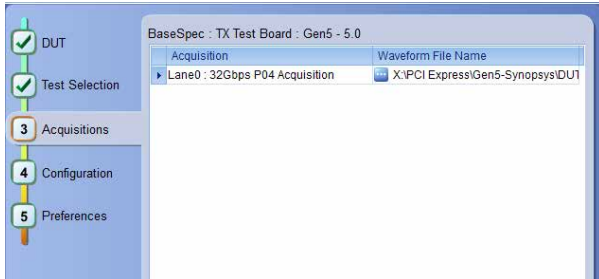


Figure 16: Acquisitions tab: using prerecorded waveforms

When using prerecorded waveform files, this panel lists available prerecorded waveform files. You can only select the source of the prerecorded waveform file for each test. See [Set acquisition waveform source for prerecorded waveform files](#).

Set acquisition options

Select an **Acquire Option** to set the order in which waveforms are acquired and analyzed:

- **Acquire All Waveforms Before Analysis:** Acquire all waveforms required by tests before performing analysis. All required user interventions (such as connecting to different lanes) are completed, and waveforms acquired, before the analysis is run. You can turn off the DUT after the acquisitions are completed.
- **Acquire Only – Do Not Analyze:** Acquire all waveforms required by tests, and then stop (do not use waveforms to perform test analysis). Use this setting for testing multiple DUTs once the test and application settings are correct. Acquire all required waveforms and save the session for each DUT, and then recall the waveforms at a later point to analyze in [Prerecorded](#) mode.

See also

[Set acquisitions signal source](#)

[Set acquisition waveform save options](#)

Set acquisition waveform save options

Select a **Save Option** to set how to save acquired test waveforms:

- **Save All the Waveforms:** Save all waveforms that were acquired for tests.
- **Save Only Analyzed Wfms:** Save waveforms that was used for analysis.
- **No Waveforms Saved – Discard after analysis:** Delete all acquired waveform data after analysis is complete.

Waveforms are saved to a folder that is unique to each session (a session starts when you click the Start button). The folder path is X:\PCI Express\Untitled Session\<DUT ID>\<date>_<time>. Images created for each analysis, CSV files with result values, reports, and other information specific to that particular execution are also saved in this folder. When the session is saved, content is moved to that session folder and the “Untitled Session” gets replaced by the session name.

Waveform file names

This application uses file name conventions to access the waveforms. It is recommended to save the waveforms with following file names.

- Differential data waveform: *Tek_PCIe_Slot_DataRate_LaneNumber_PresetNumber_Data_Differential.wfm*
Example: *Tek_PCIe_01_8Gbps_Ln00_P0_d_Diff.wfm*
- Differential clock waveform: *Tek_PCIe_Slot_DataRate_LaneNumberClk_PresetNumber_Data_Differential.wfm*
Example: *Tek_PCIe_01_8Gbps_Ln00Clk_P0_d_Diff.wfm*
- Single ended data positive waveform: *Tek_PCIe_Slot_DataRate_LaneNumber_PresetNumber_Data_Pos.wfm*
Example: *Tek_PCIe_01_8Gbps_Ln00_P0_d_Pos.wfm*
- Single ended data negative waveform: *Tek_PCIe_Slot_DataRate_LaneNumber_PresetNumber_Data_Neg.wfm*
Example: *Tek_PCIe_01_8Gbps_Ln00_P0_d_Neg.wfm*

See also

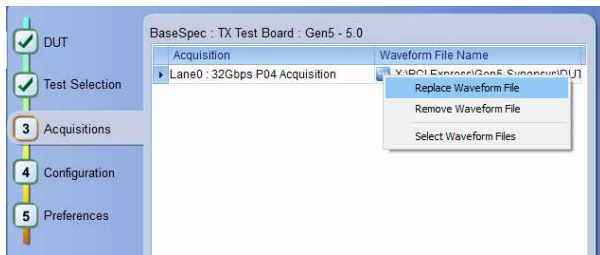
[Set acquisitions signal source](#)

[Set acquisition waveform source for prerecorded waveform files](#)

[Set acquisition Acquire options](#)

Set acquisition waveform source for prerecorded waveform files

When using prerecorded waveform files, there are no acquisition source selections to make. You can only select the source of the prerecorded waveform files for each test.



If you selected to use a prerecorded waveform file (in the DUT tab), the lane and source fields are not applicable and are not shown. The Acquisition tab instead shows a table of the waveforms used for the required test acquisitions.

You can load a different waveform file for each table item. To load a different waveform file:

- Click the ellipsis button (⋮) of the waveform file to change.
- Select the waveform task to perform (replace, remove, or select the waveform file).
- Use the dialog box to navigate to and select the waveform file with which to replace the current file. You need to select all required differential waveforms for analysis. For example, select one data waveform and one clock waveform for each acquisition (except 2.5 Gbps) for testing a system board.



Note: Clock signals are not required for Gen1 (2.5 Gbps data rate) testing.

See also

[Set acquisition signal source](#)

[Set acquisition options](#)

[Set acquisition waveform save options](#)

Set acquisition signal source

Use this procedure to set the channel sources for live waveform acquisitions. The number of Lane and Source fields shown depends on the number of lanes selected for testing in the **DUT** tab.

1. Click **Setup > Acquisitions**.
2. Click in the Source column of the field to change.
3. Click the arrow button to list available sources from which to select.

CEM : System-Board : Gen4 - 4.0

Lanes:0

Lane	Source	Lane	Source
Data1+	CH1	Clock+	CH2
Data1-	CH3	Clock-	CH4

See also

[Set acquisition options](#)

[Set acquisition waveform save options](#)

[Set acquisition waveform source for prerecorded waveform files](#)

No. of Acquisitions

Use this procedure to set the number of acquisitions for each signal in the dropdown. This procedure is applicable for CEM Gen4 and Gen5. Minimum number of acquisition is 1 and the maximum is 10. Default selected is 1.

No. Of Acquisitions

Gen4 ▼

Gen5 ▼

Jitter Test Acquisition

Use this procedure to choose the signal pattern to acquire the Gen5 Base jitter measurements. This procedure is applicable for Basespec Gen5 Jitter measurements only. The available options are Compliance and Data Clock. Compliance is selected as default option.

Jitter Test Acquisition (Gen5)

☒ Compliance

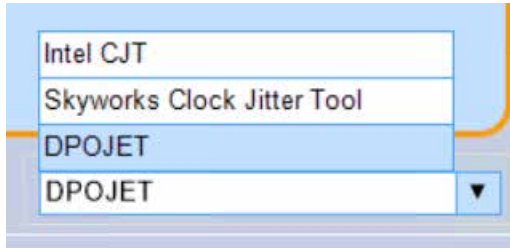
☐ Data Clock

Analysis Tool

Use this procedure to choose the analysis tool to be used for the Ref Clock testing.

Available options are:

- Intel CJT
- Skyworks Clock Jitter Tool
- DPOJET



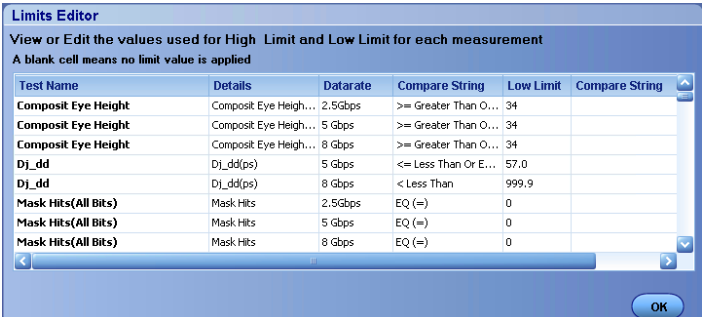
Configuration: Set measurement limits for tests

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: You cannot change test parameters that are grayed out.

Table 10: Configuration tab: Common parameters

Settings	Description
Limit Editor	<p>Displays the upper and lower limits for the applicable measurement using different types of comparisons.</p> 

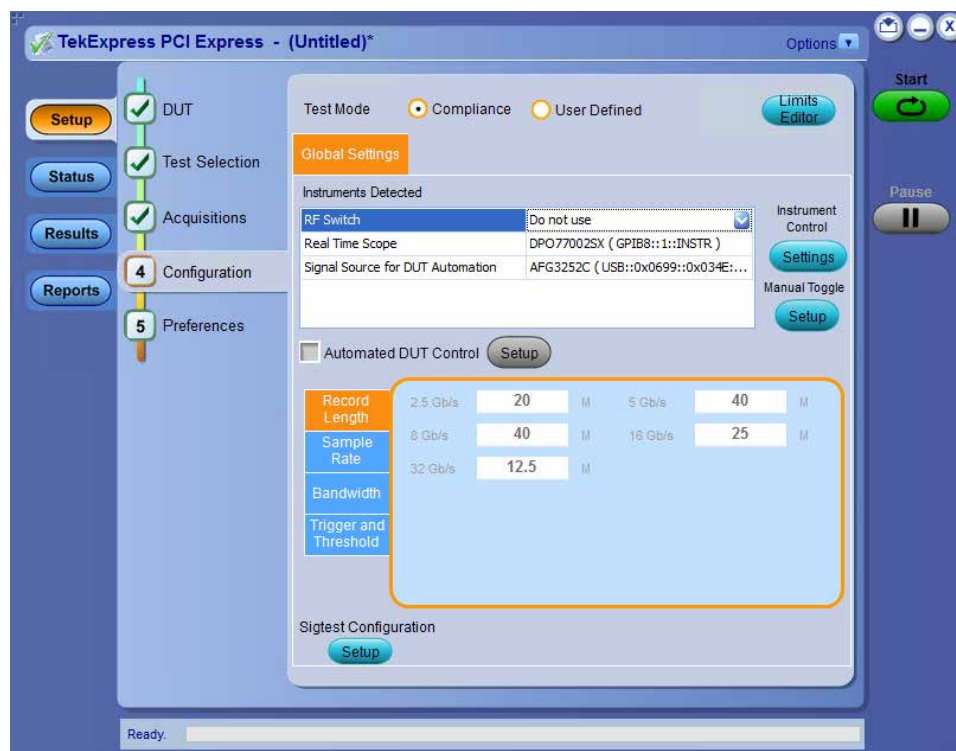




Figure 17: Configuration tab: Global Settings

Table 11: Configuration tab: Global Settings configuration

Setting	Description
Test Mode	<p>Determines whether test parameters are in compliance or can be edited (User Defined Mode).</p> <ul style="list-style-type: none"> Compliance: Most test parameter values cannot be edited. User Defined: Enables editing of most test parameters. <p> Note: Not applicable for the Device type / Specification type BaseSpec</p>
Instruments Detected	Displays a list of the connected instruments found during the instrument discovery. Instrument types include equipment such as oscilloscopes and signal generators.
Instrument Control	Click Settings to search for connected instruments and view instrument connection details. Connected instruments displayed in TekExpress instrument control settings and can be selected for use under Global Settings in the test configuration section.
Manual Toggle	<p>Click Setup to manually toggle AWG or AFG.</p> <p>This is enabled when the Signal Source for DUT Automation in Instruments Detected is selected.</p>
Automated DUT Control	Enables automatic toggling of test patterns for DUT tests. Requires an AWG or AFG as part of the test setup. Click Setup to configure the DUT automation settings.
Record Length, Sample Rate, Bandwidth	<p>These settings apply to all tests selected for the indicated data rate.</p> <ul style="list-style-type: none"> Record Length: Specifies the waveform record length. Sample Rate: Specifies the oscilloscope sample rate to use for all tests. Bandwidth: Specifies the oscilloscope bandwidth to use for all tests.
Sig Validation Threshold	Sets the threshold voltage to use for signal validation.
Trigger Type (Gen3/Gen4/Gen5)	<ul style="list-style-type: none"> Edge Width Auto <p> Note: When auto is selected, width trigger type is applied. If it fails, edge trigger type is applied.</p>
CTLE	This configuration setting allows the user to configure for CTLE optimization for Gen6 jitter measurements. Refer CTLE optimization feature for more details.
Scope Noise	This configuration setting allows the user to apply scope noise compensation for CTLE optimization and measurement analysis for Gen6 data rate test. Refer Scope Noise Characterization for more details.
SigTest Configuration	<p>Click Setup; select the executable (.exe) for Gen1, 2, 3, 4, and 5 and template configuration for signal quality and preset tests for the data rates selected.</p> <p>Check/Un-check Silent mode to run sigtest in Silent mode/non-silent mode.</p>
Analysis tool (For RfClockSpec Only)	<ul style="list-style-type: none"> Intel CJT Skyworks Clock Jitter Tool DPOJET

CTLE optimization feature

This configuration setting allows the user to configure for CTLE optimization for Gen6 jitter measurements.

- Record Length:
 - The Record Length of the waveform to be acquired for CTLE optimization.
 - Range 1M to 20M. Default value is 1M
- Step Size:
 - Sets up the step size for the CTLE optimization iteration.
 - Values: 1, 0.5, 0.25
- Optimum CTLE:
 - User defined CTLE value.
 - Default value 0.0 dB

Scope Noise Characterization

This configuration setting allows the user to apply scope noise compensation for CTLE optimization and measurement analysis for Gen6 data rate test.

There are two modes to apply the scope noise.

- Automated Scope Noise
- Manual Scope Noise

Automated Scope Noise calculates the Scope Noise for various Vertical settings, Filter files, and CTLE. During execution it will select the Scope Noise which is closest in Vertical Scale to the Vertical Scale decided.

Manual Mode will use the same Noise Compensation irrespective of Vertical Scale and CTLE applied.

Use the radio buttons to switch between these modes.

Automated Scope Noise

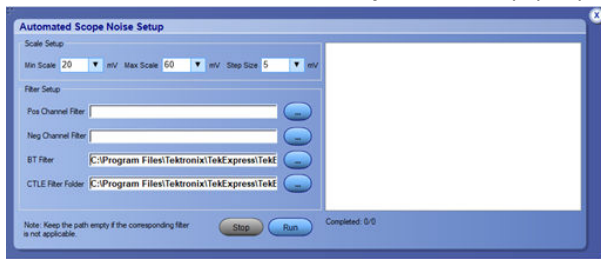
This functionality works in two steps:

1. Creating the Scope Noise Data.



Note: This step is to be done before running the TekExpress test session.

- In Automated Mode, click on the **Setup** button. This pops up the '**Automated Scope Noise Setup**' window.



- Select Min, Max Scale, Step Size and applicable filters and then click **Run**.

It will calculate the scope noise value for the selected scales and for different Filter combinations. For example: Live_BT, Live_BT_CTLE0, Live_BT_CTLE1.... Live_BT_CTLE15, and store them in a csv file. The file path is C:\Program Files\Tektronix\TekExpress\TekExpress PCI Express\ScopeNoiseData.

2. Using the scope noise data during test run.

- When we run the test session, the appropriate value will be picked up from the file based on the scale of the waveform acquired and the filters applied. TekExpress searches this scope noise value during the CTLE optimization (to run RJ measurement) and during the measurement analysis.

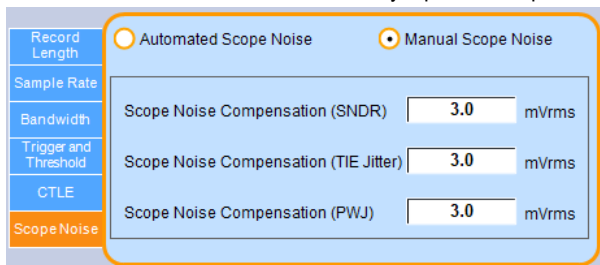


Note: If the waveform scale value falls in between the available values in the file, then nearest scale value would be picked up.

- If the file is not present or the searched combination is not present in the table then TekExpress uses the default values selected under manual mode.

Manual Scope Noise

In the manual mode the user can directly input the scope noise compensation value for corresponding measurement types.



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.

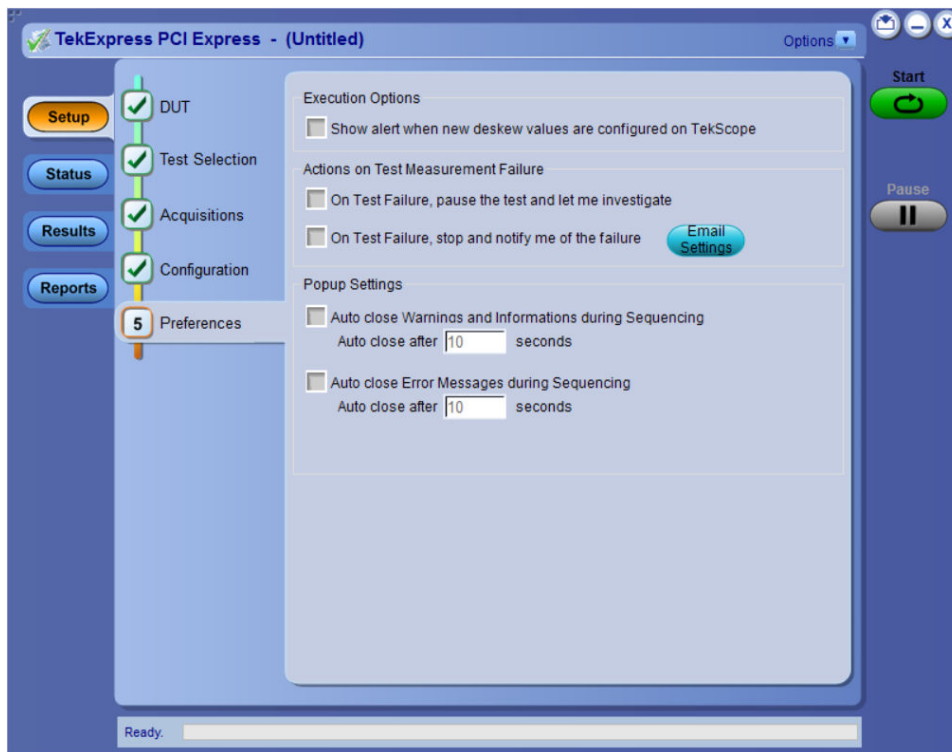


Figure 18: Preferences tab

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

Table 12: Preferences tab settings

Setting	Description
Execution Options	
Show alert when new deskew values are configured on TekScope	
Actions on Test Measurement Failure	
On Test Failure, pause the test and let me investigate	Select to pause the test run and allow you to investigate when the test execution is failed.
On Test Failure, stop and notify me of the failure	Select to stop the test run on Test Failure, and to get notified via email. By default, it is unselected. Click Email Settings to configure the email settings to receive notifications.
Popup Settings	
Auto close Warnings and informations during Sequencing	Select to close the warnings and information window automatically after the specified amount of time.
Auto close after <no> seconds	Specify the time in seconds using the edit box.
Table continued...	

Setting	Description
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.

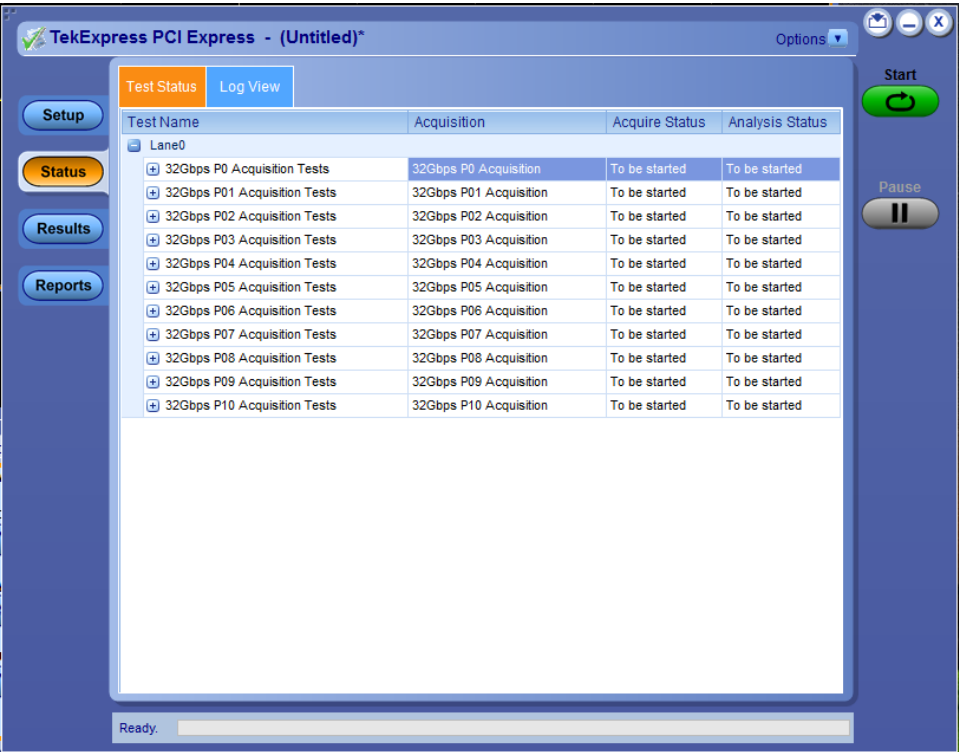


Figure 19: Test execution status view in Status panel

Table 13: Test execution status table headers

Control	Description
Test Name	Displays the measurement name.
Acquisition	Describes the type of data being acquired.
Acquire Status	Displays the progress state of the acquisition: <ul style="list-style-type: none">To be startedStarted AcquisitionCompleted Acquisition

Table continued...

Control	Description
Analysis Status	<p>Displays the progress state of the analysis:</p> <ul style="list-style-type: none"> To be started In Progress Completed

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.

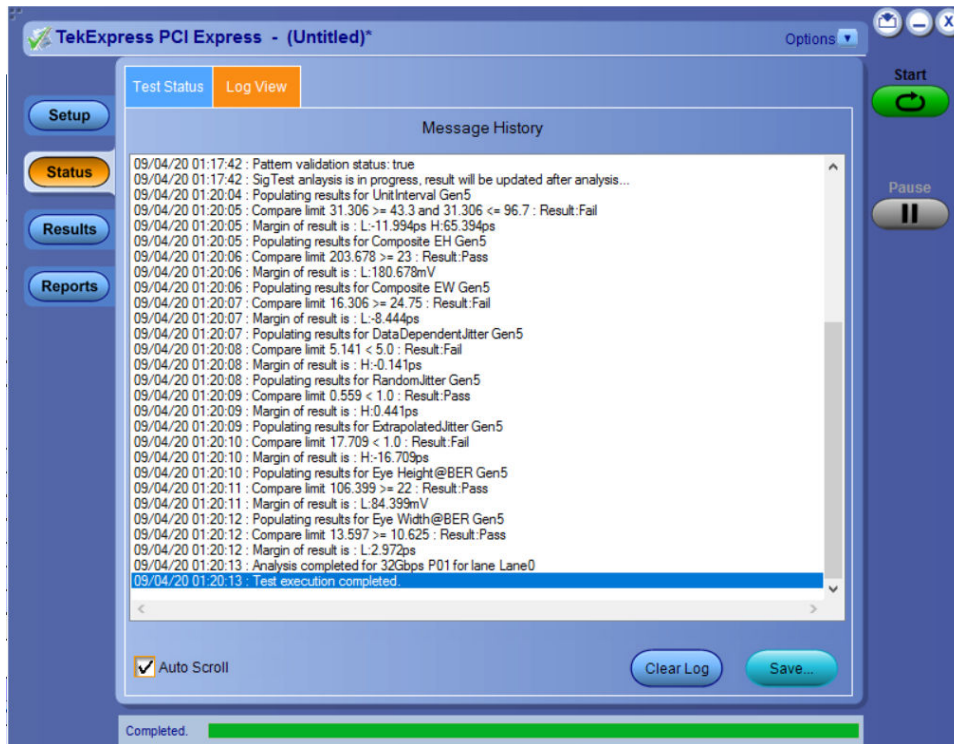


Figure 20: Log view in Status panel

Table 14: Status panel settings

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

Results panel: View summary of test results

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

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

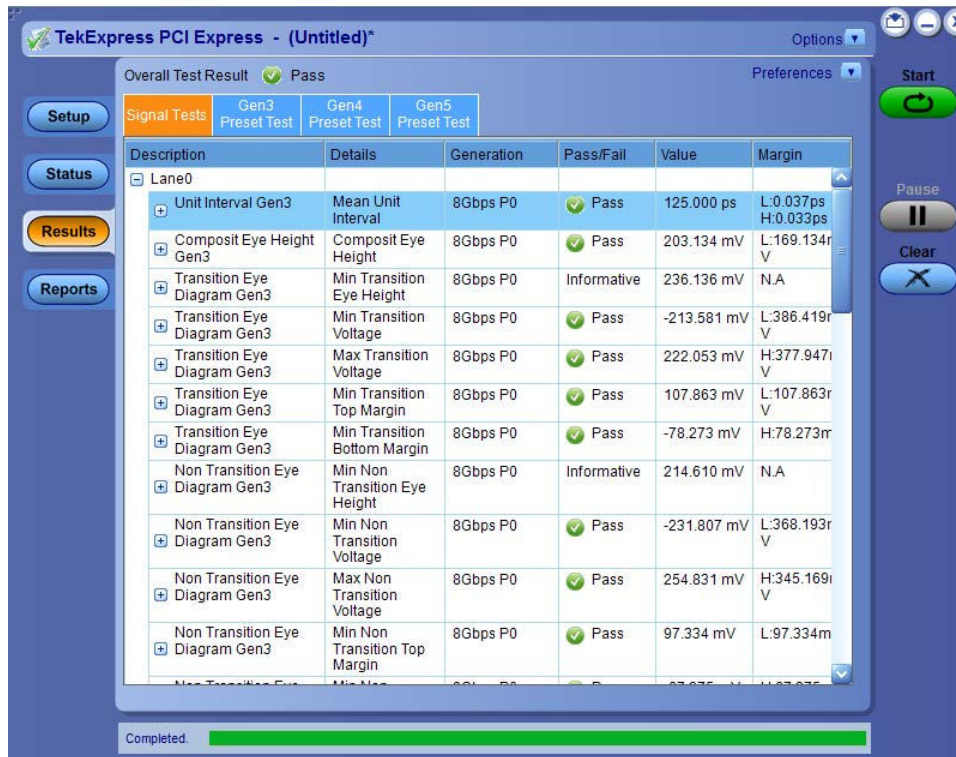



Figure 21: Results panel with measurement results

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

Filter the test results

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

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

Reports panel: Configure report generation settings

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

Report configuration settings

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

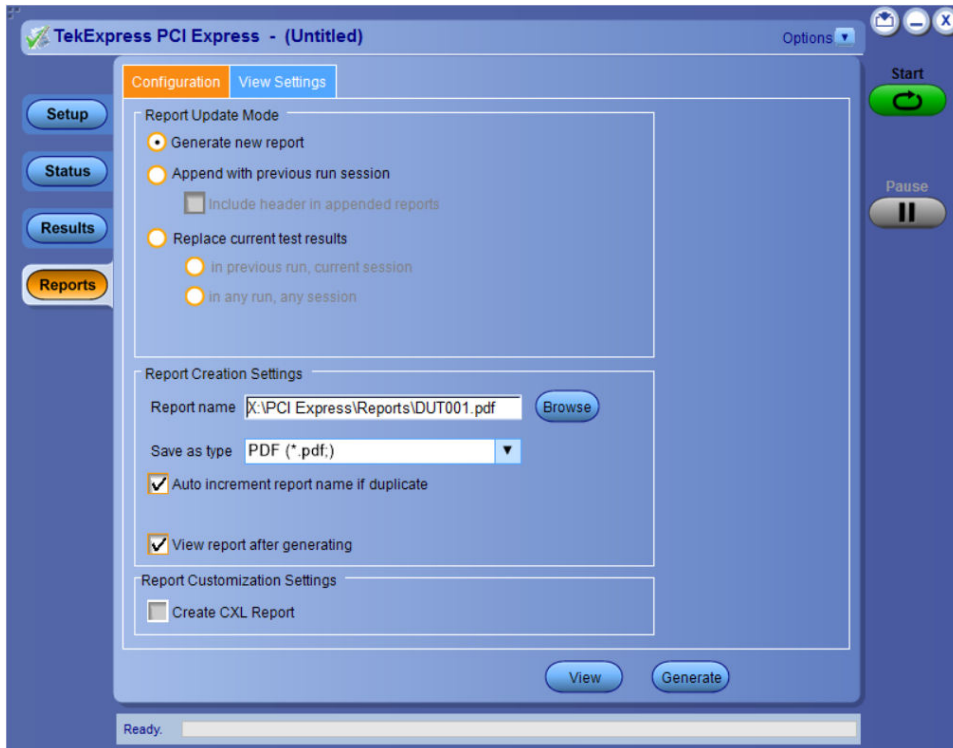





Figure 22: Report panel- Configuration tab

Table 15: Report configuration panel settings

Control	Description
View	Click to view the most current report.
Generate	Generates a new report based on the current analysis results.
Report Update Mode Settings	
Generate new report	Each time when you click Run and when the test execution is complete, it will create a new report. The report can be in either .mht, .pdf, or .csv file formats.
Append with previous run session	Appends the latest test results to the end of the current test results report. Each time when you click this option and run the tests, it will run the previously failed tests and replace the failed test result with the new pass test result in the same report.
Include header in appended reports	Select to include header in appended reports.
Table continued...	

Control	Description
Replace current test results	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	<p>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.</p> <p>To change the report name or location, do one of the following:</p> <ul style="list-style-type: none"> 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. <p>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.</p> <p> Note: You cannot set the file location using the Browse button.</p> <p>Open an existing report</p> <p>Click Browse, locate and select the report file and then click View at the bottom of the panel.</p>
Save as type	<p>Saves a report in the specified file type, selected from the drop-down list. The report is saved in .csv, .pdf, or .mht.</p> <p>Note:</p> <p> 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.</p>
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.
View report after generating	Automatically opens the report in a Web browser when the test execution is complete. This option is selected by default.
Report Customization Settings	
Create CXL Report	<p>Creates CXL device type for AIC/SYB of CEM Spec and Tx Test Board/SRIS Test Board of BaseSpec.</p> <p> Note: This option is unselected by default.</p>

CXL Support

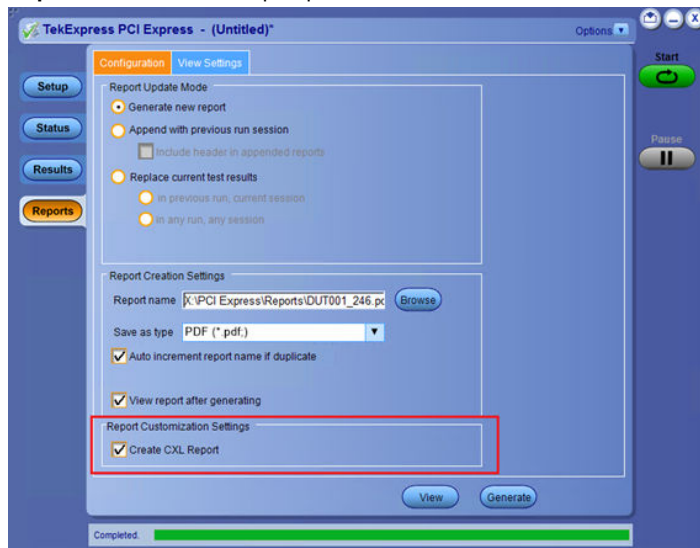


Note: CXL device type support is newly added to the TekExpress PCIe TX application.

- Supported Device Type and Data Rates:**

Device Types	Data Rates
CXL Add-In Card	<ul style="list-style-type: none"> 8 GB/s 16 GB/s 32 GB/s
CXL System Board	<ul style="list-style-type: none"> 8 GB/s 16 GB/s 32 GB/s
CXL TX Test Board	<ul style="list-style-type: none"> 8 GB/s 16 GB/s 32 GB/s
CXL SRIS TX Test Board	<ul style="list-style-type: none"> 16 GB/s 32 GB/s

- Specification Reference:** PCI Express Card Electromechanical Specification Revision 4.0 v1.0 and PCI Express Base Specification Revision 4.0 v1.0
- Test Setup:** The test setup for CXL is same as CEM or Base specification device types. Additionally, user needs to select **Create CXL Report** checkbox in the report panel to run the test in CXL mode.



Configure report view settings

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

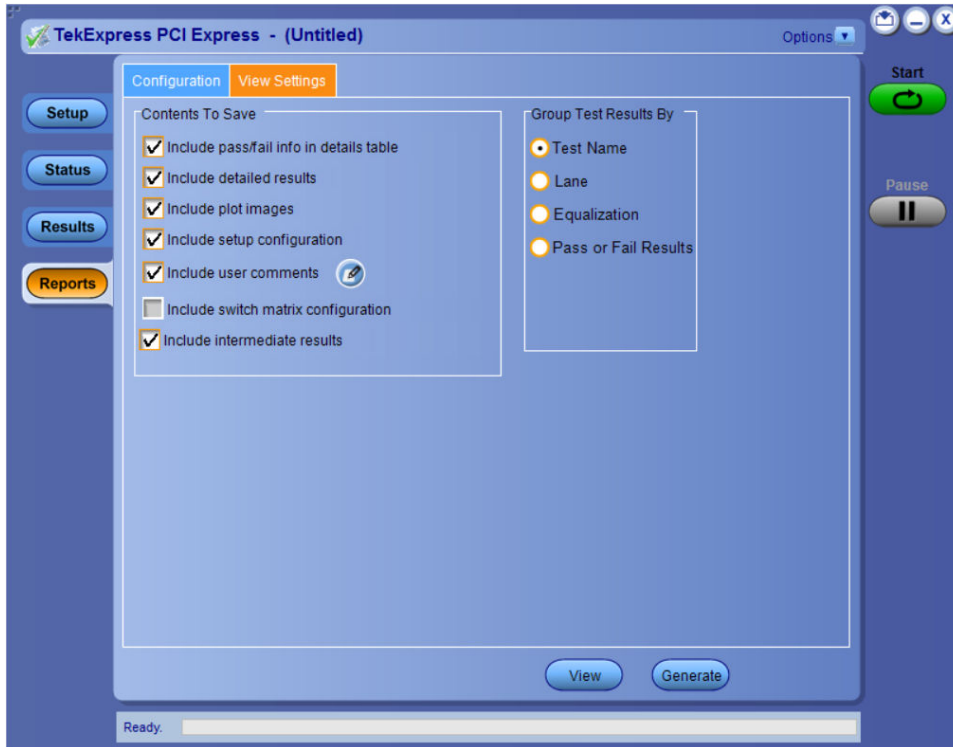


Figure 23: Report panel-View settings tab

Table 16: Report panel view settings

Control	Description
Contents To Save Settings	
Include pass/fail info in details table	Select to include pass/fail information in the details table of the report.
Include detailed results	Select to include detailed results in the report.
Include plot images	Select to include the plot images in the report.
Include setup configuration	Sets the application to include hardware and software information in the summary box at the top of the report. Information includes: the oscilloscope model and serial number, the oscilloscope firmware version, and software versions for applications used in the measurements.
Include 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 switch matrix configuration	Select to include the switch matrix configuration in the report.
Include Intermediate Results	Select to include intermediate test results for Gen4 and Gen5.
Group Test Result By	
Test Name	Select to group the test results based on the test name in the report..

Table continued...

Control	Description
Lane	Select to display the test results by lane.
Equalization	Select to display the test results by equalization.
Pass/Fail Results	Select to display the test results by pass or fail results.

View a generated report

Sample report and its contents

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



Figure 24: Report

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.
Generation Pass/Fail Table	The Generation Pass/Fail Table shows the pass/fail result of each individual generation. This table is shown only when the results are grouped by Test Name.

Saving and recalling test setup

Overview

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

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

Figure 25: Example of Test Setup File

Use test setups to:

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

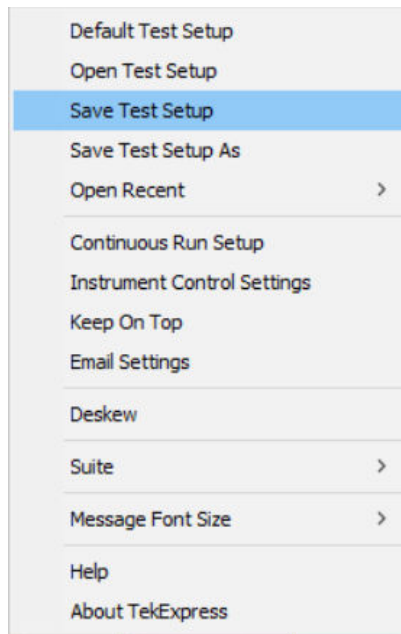


Note: Images that are shown in this Saving and recalling test setup chapter are for illustration purpose only and it may vary depending on the TekExpress application.

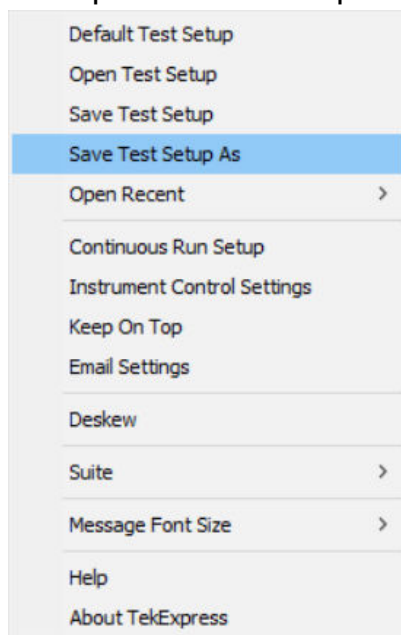
Save the configured test setup

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

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



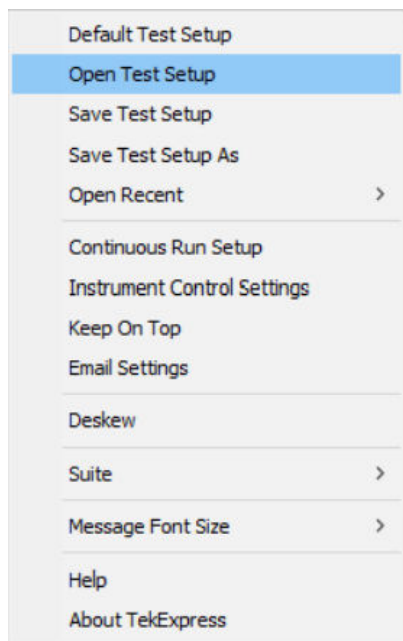
- Select **Options > Save Test Setup As** to save the setup with different name.



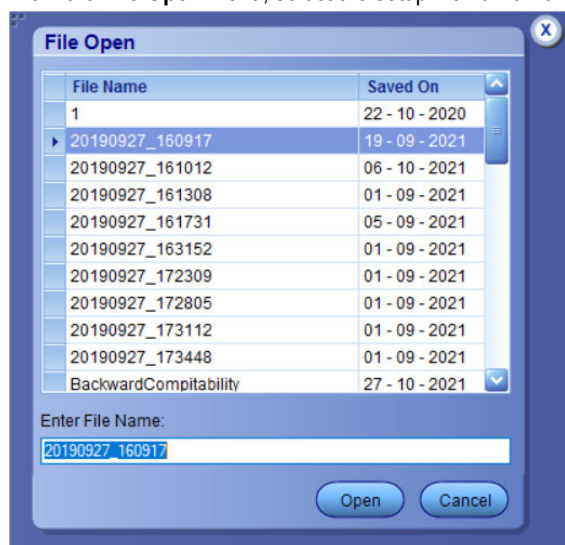
Load a saved test setup

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

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



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

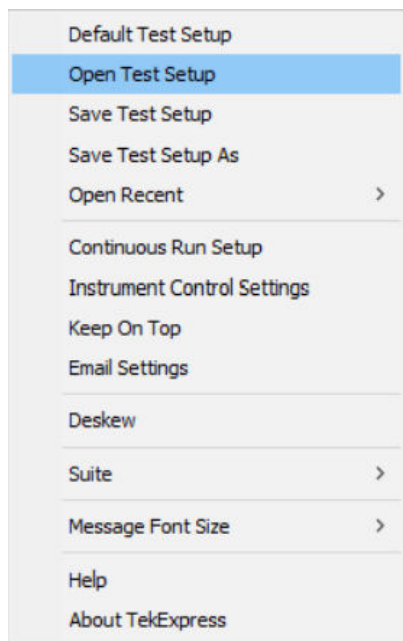


Note: Parameters that are set for the respective test setup will enable after opening the file.

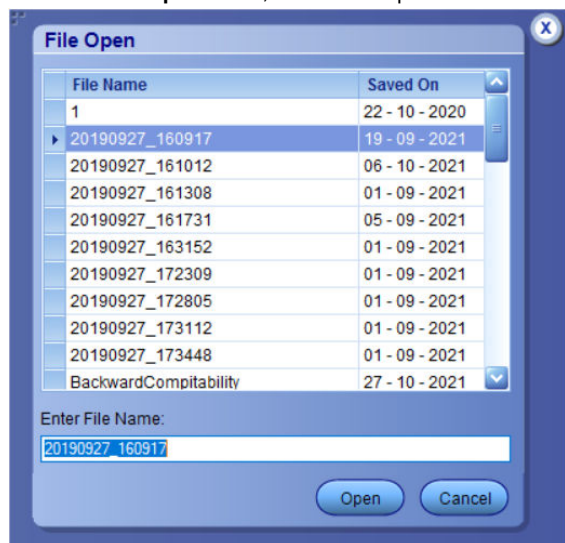
Perform a test using pre-run session files

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

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

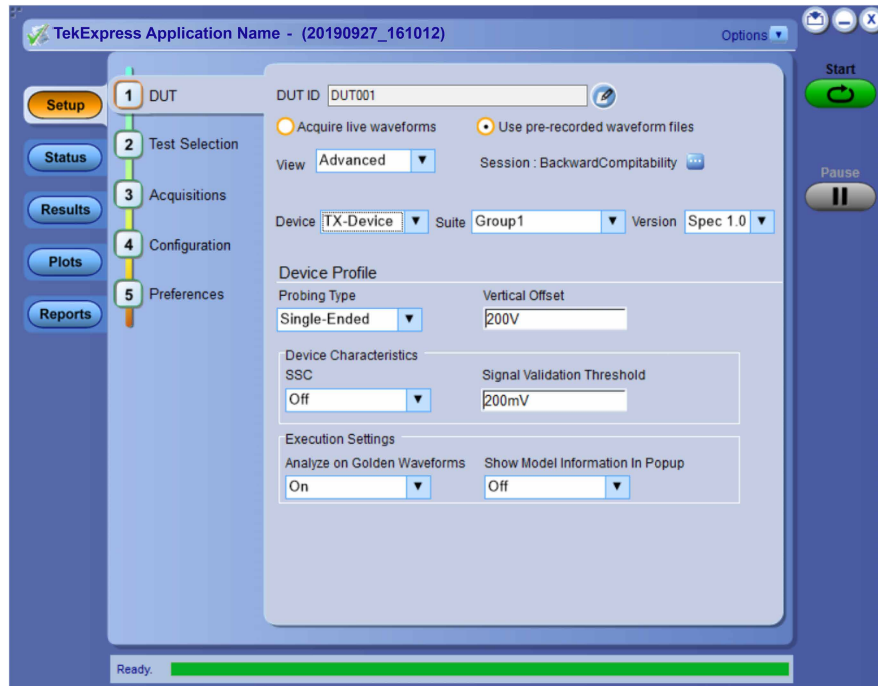


- From the **File Open** menu, select a setup from the list and then click **Open**.

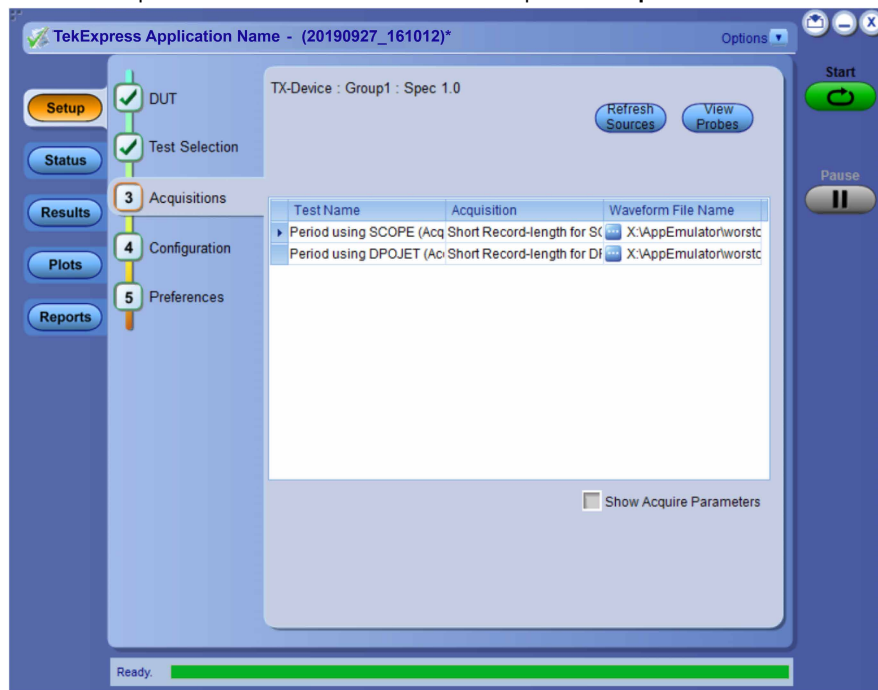



Note: Parameters that are set for the respective test setup will enable after opening the file.

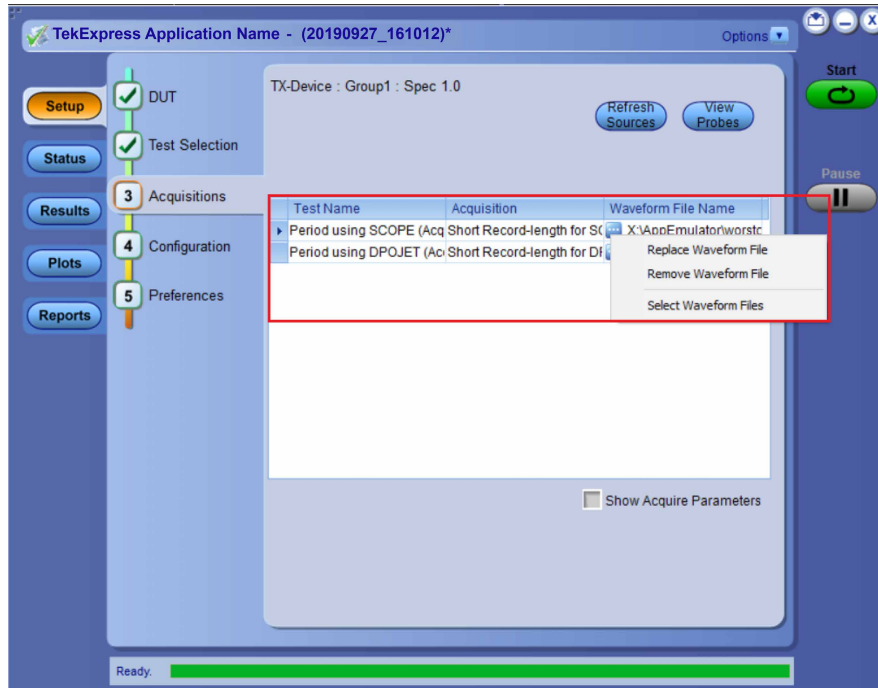
- Switch the mode to **Use Pre-recorded waveform files** in the DUT panel.



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



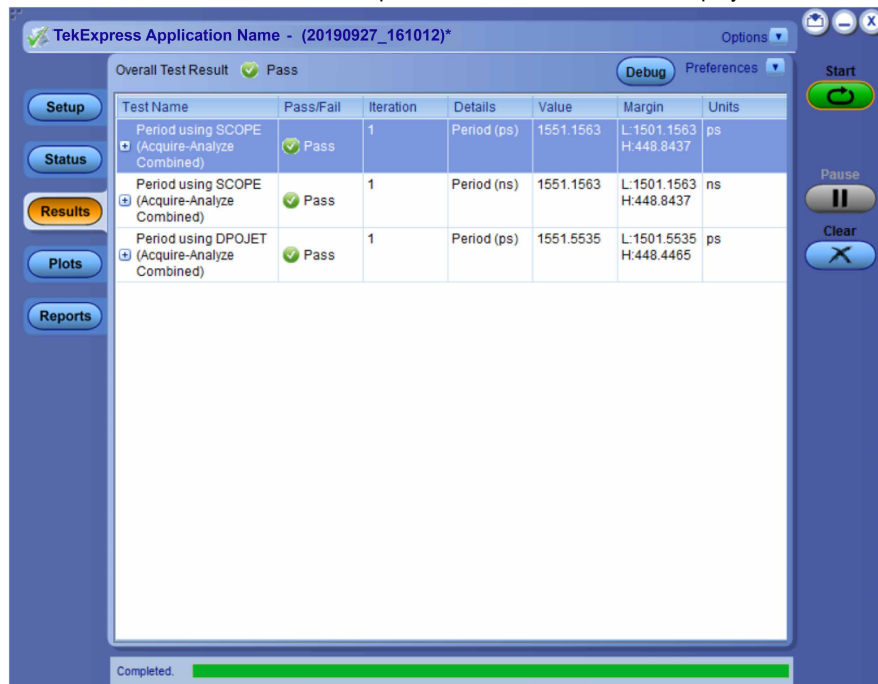
5. The selected waveform file can be removed/replaced by clicking on the () icon.



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

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

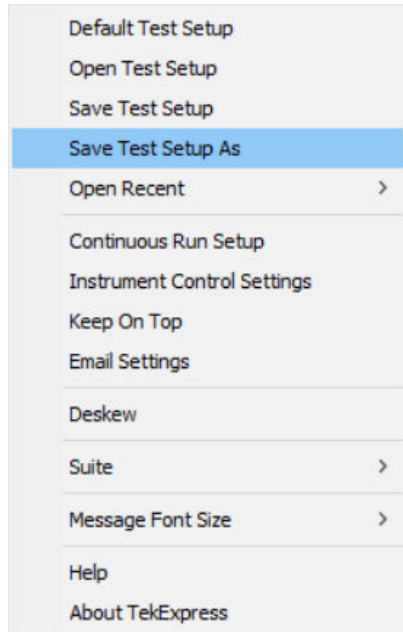
7. The overall test result status after completion of the test execution is displayed in the Results Panel.



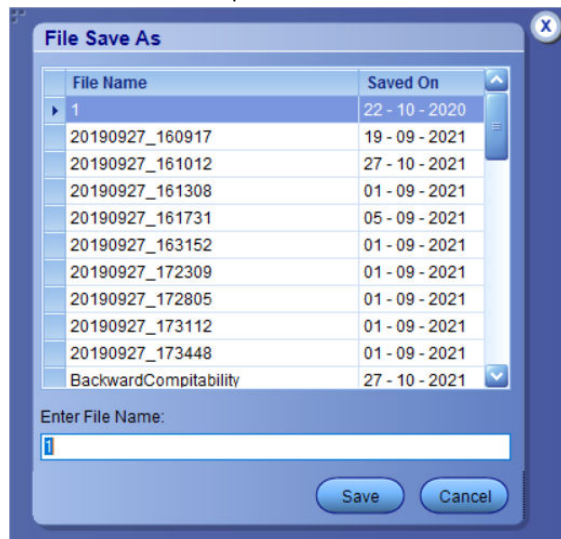
Save the test setup with a different name

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

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



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



Switch Matrix application

Product description

Switch Matrix application allows to configure and setup automated multi-lane testing using RF switch. The solution allows you to map each of the several transmitter signals and forward the selected input either to another relay or to the oscilloscope channel.

Application overview

This section describes the Switch Matrix application settings.

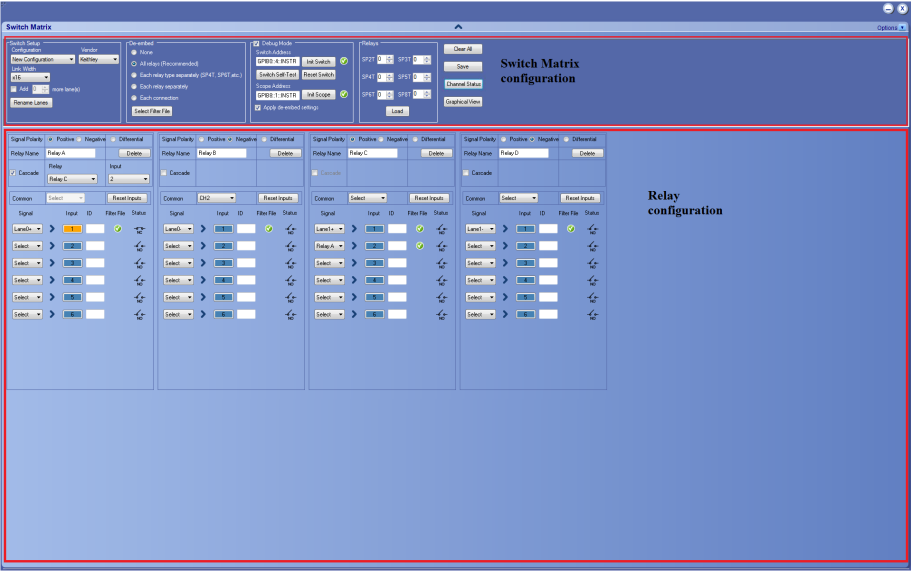

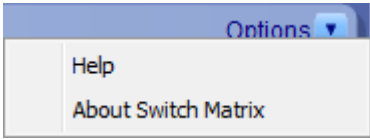


Table 17: Switch Matrix configuration settings

Item	Description
	Click to expand/collapse the switch matrix configuration.
Options 	Click Help to view the software help document and About Switch Matrix for software version.
Switch Matrix configuration	
Table continued...	

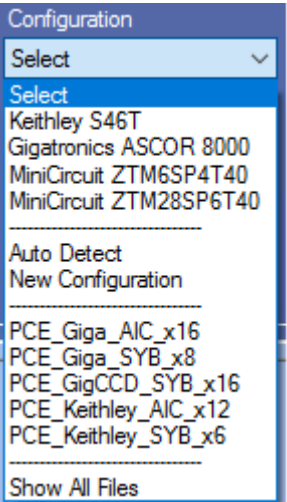
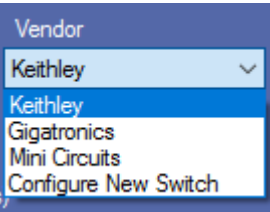
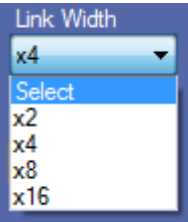

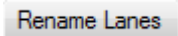
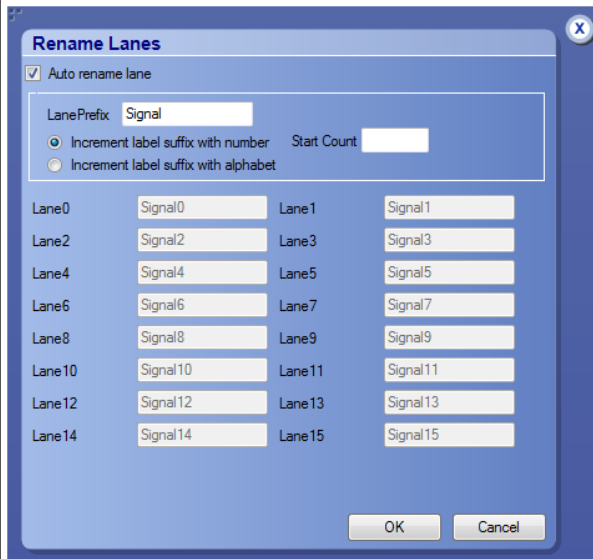
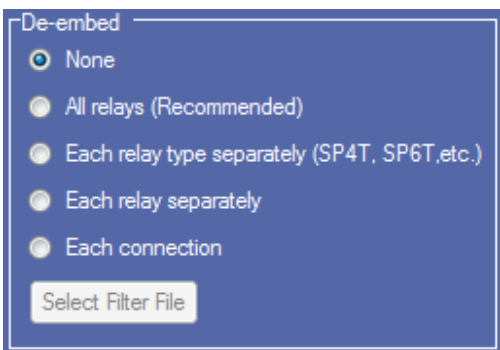
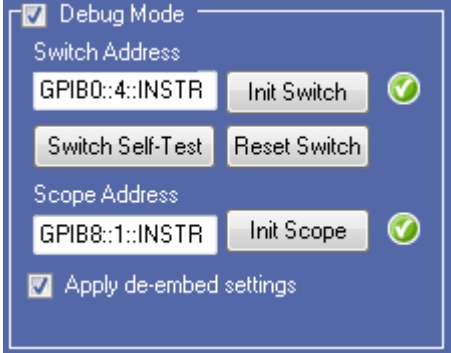


Item	Description
<p>Configuration</p> 	<p>Select the configuration option:</p> <ul style="list-style-type: none"> • Keithley S46T: 6-input-to-1-output switch configuration • Gigatronics ASCOR 8000: 8-input-to-1-output switch configuration • MiniCircuit ZTM6SP4T40: 4-input-to-1-output switch configuration • MiniCircuit ZTM28SP6T40: 6-input-to-1-output switch configuration • Auto Detect: Select to autodetect the switch. • New Configuration: Select to manually configure the switch. • Saved file names: Saved configuration file name(s) are displayed in the drop-down list. Select to recall the configuration. <p>Below are the list of saved files available for Keithley and Gigatronics configurations.</p> <ul style="list-style-type: none"> • PCE_Giga_AIC_x16 • PCE_Giga_SYB_x8 • PCE_GigaCCD_SYB_x16 • PCE_Keithley_AIC_x12 • PCE_Keithley_SYB_x6 • Show All Files: Select to view the list of all saved files.
<p>Vendor</p> 	<p>Select the vendor from the drop-down list. This field is displayed:</p> <ul style="list-style-type: none"> • When you select Configuration > New Configuration to create a fresh configuration. • When you open a saved configuration. The displayed vendor name is not editable. • When Auto Detect is selected. The displayed vendor name is not editable.
<p>Link Width</p> 	<p>Select the Link Width from the drop-down list. This determines the maximum number of lanes supported by the DUT.</p>

Table continued...

Item	Description
<p>Add <X> more lane(s)</p> 	<p>Select to add extra lanes (Additional1, Additional2,...) to the lanes list. The extra lanes added are displayed in the relay signals.</p> <p>You can add a maximum of 10 lanes.</p>
<p>Rename Lanes</p> 	<p>Click to rename the lanes. Enter the LanePrefix and select the increment label type to suffix by either number or alphabet. The number of lanes depends on the Link Width selected. Clear the Auto rename lane check box to set unique names for the lanes.</p> 
De-embed	
<p>De-embed ¹⁰</p> 	<p>Select the De-embed option:</p> <ul style="list-style-type: none"> • None • <i>All relays (Recommended)</i> • <i>Each relay type separately (SP4T, SP6T, etc.)</i> • <i>Each relay separately</i> • <i>Each connection</i> <p>Select the de-embed option and click Select Filter File to browse and select the filter file(s).</p>
Debug Mode	
Table continued...	

¹⁰ Configure at least one relay before configuring the de-embed settings.

Item	Description
<p><i>Debug Mode</i></p> 	<p>Select Debug Mode to manually configure the switch.</p> <p>Switch Address</p> <p>Enter the Switch Address in the GPIB or TCPIP format.</p> <p>GPIB format: <code>GPIB0 : X : INSTR</code></p> <p>TCPIP format: <code>TCPIP : : IPADDR : : INSTR</code></p> <p>Init Switch</p> <p>This will synchronize the configuration of relay(s) in the application with the relay(s) in the switch. Synchronization will be successful only for the relays whose configuration matches with the physical switch. Pass/Fail status is displayed next to the button.</p> <p> Note: Relay configurations (number of relays, number of relay inputs, and name of relays) in the application should match the physical switch, for successful synchronization.</p> <p>Switch Self-Test</p> <p>This will close and open all switch channels one-by-one and displays the pass/fail status of the channel next to the ID. A self-test report (CSV) is generated at the end of the process. You cannot abort this process.</p> <p> Note: Initialize the switch before performing the self-test.</p> <p>Reset Switch</p> <p>Click Reset Switch to reset the switch. This will open all channels.</p> <p>Scope Address</p> <p>Enter the oscilloscope address in the GPIB or TCPIP format.</p> <p>GPIB format: <code>GPIB0 : X : INSTR</code></p> <p>TCPIP format: <code>TCPIP : : IPADDR : : INSTR</code></p> <p>Init Scope</p> <p>Enter the oscilloscope address in the Scope Address field and click Init Scope to initialize the oscilloscope. This will establish the connection with the oscilloscope. The pass/fail status is displayed next to the button.</p> <p>Apply De-embed settings</p> <p>Select to apply de-embed settings to the channels.</p> <p>When the oscilloscope is initialized and de-embed settings are configured, closing a connection will apply the de-embed settings and then close the connection.</p>
<p>Relays</p> <p>Table continued...</p>	

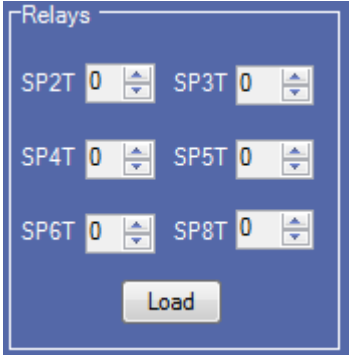


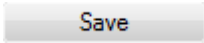
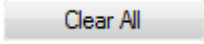


Item	Description
<p>Relays</p> 	<p>Select the relay(s). In SPnT, <i>n</i> represents the number of connection signals for the relay. For example, SP4T is a four signal connection relay.</p> <p>This field displays only for a new configuration. By default, zero relays are selected.</p> <p>Enter the total number of relays to be loaded in their respective input box and click Load.</p> <p>You can also click  or  to increase or decrease the number.</p>
<p>Save</p> 	<p>Click to save the configuration at <i>C:\ProgramData\Tektronix\Switch Matrix Configurations*.xml</i>.</p> <p>This operation checks whether all the required configurations are done. If any of the required configurations are not selected, then error popup is displayed, which prompts you to complete the configuration(s).</p>
<p>Clear All</p> 	<p>Click to clear all configurations. The application will be loaded with Configuration drop-down (default).</p>
<p>Channel Status</p> 	<p>Click to view the relays and status of channels of Keithley or Gigatronics switch. This updates the channel status dynamically.</p> <p>In Switch Channel Status Viewer, select the Vendor type, enter the Switch Address and click Init to initialize the switch. This will establish the connection with the switch.</p> <p>Click Query Status to get the details of the relays of the switch and the status of the channels.</p> <p>Click Reset to reset the status viewer.</p> 

Table continued...

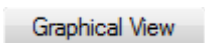
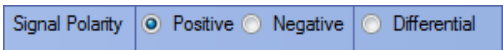
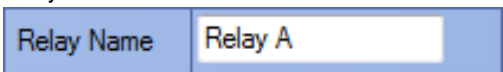
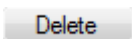
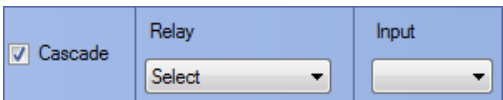



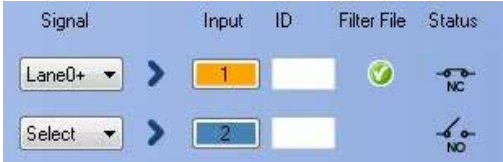




Item	Description
<p>Graphical View</p> <p></p>	<p>Click to view the graphical representation of the configured relays. If the relays are cascaded, then they are also displayed in the graphical representation.</p>
Relay configuration	
<p>Signal Polarity</p> <p></p>	<p>Select the signal polarity of DUT:</p> <ul style="list-style-type: none"> • Positive: populates Lane0+, Lane1+, connection signals. • Negative: populates Lane0-, Lane1-, connection signals. • Differential: populates Lane0, Lane1, connection signals.
<p>Relay Name</p> <p></p>	<p>Enter the relay name. This name should match the relay name of the connected switch.</p>
<p>Delete</p> <p></p>	<p>Click to delete the relay. This configuration is only available for the configured (loaded) relays, when Configuration > New Configuration is selected.</p>
<p>Cascade</p> <p></p>	<p>Select to cascade the relay by connecting the common channel as the input signal for another relay.</p> <p>Select the Relay and the Input of the relay. Check that the selected relay signal displays the appropriate relay name.</p> <p>The cascade settings is also displayed in the graphical view.</p> <p>Click here to get details about Cascade.</p> <p> Note: Select the cascade settings before you save the configuration.</p>
<p>Common</p> <p></p>	<p>Select the oscilloscope channel for Common. If cascaded, it displays the name of the relay.</p> <p>Click Reset Inputs to clear all connection signal settings.</p> <p> Note: Select the common settings for all the relays, before you save the configuration.</p>

Table continued...

Item	Description
	<p>Signal</p> <p>Select the DUT connection signal. This drop-down list shows the lanes based on Link Width and Signal Polarity settings.</p> <p>If the link width is x8 and signal polarity is Positive, then the Signal drop-down list will have Lane0+ to Lane7+ options.</p> <p>Input</p> <p>This button is enabled only in debug mode and if a valid signal is configured for the channel. Click to close or open the channel.</p> <p>ID</p> <p>Enter the three character alias name for the channel. This is shown in the graphical view of switch matrix configuration.</p> <p>Filter File</p> <p>This column shows  or  indicating the status of the filter file configuration for the channel. If no de-embed option is selected, then this column remains blank.</p> <p>Status</p> <p>This column displays the status of the channel.</p> <p>Channel closed (normally closed) : </p> <p>Channel opened (normally opened) : </p>

File name extensions

This application uses the following file name extensions:

File name extension	Description
.html	Saved configuration and Graphical view file formats
.xml	Switch Matrix configuration files

Status indicators





Status indicators	Description
	Success indicator
	Failure indicator
	Closed channel indicator (NC = Normally Closed)

Table continued...

Status indicators	Description
 NO	Opened channel indicator (NO = Normally Opened)

Saved configurations

Click **Configuration > Show All Files** to view the list of all saved files.

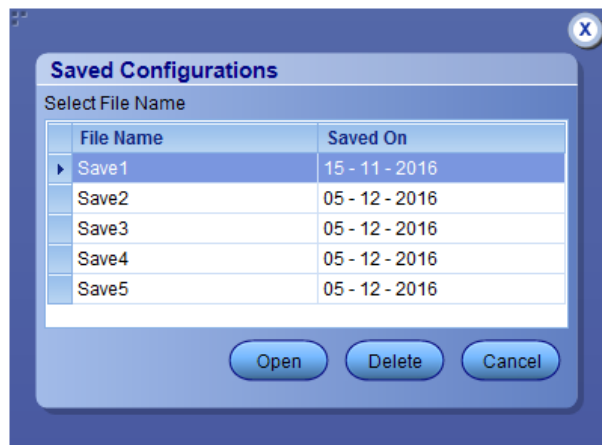


Table 18: Saved configurations

Item	Description
Open	Opens the selected file.
Delete	Deletes the selected file.
Cancel	Closes the Saved Configurations window.

De-embed settings

De-embed allows you to apply filter file(s) for relay(s). Select the De-embed option and click **Select Filter File** to browse and select the filter file(s).

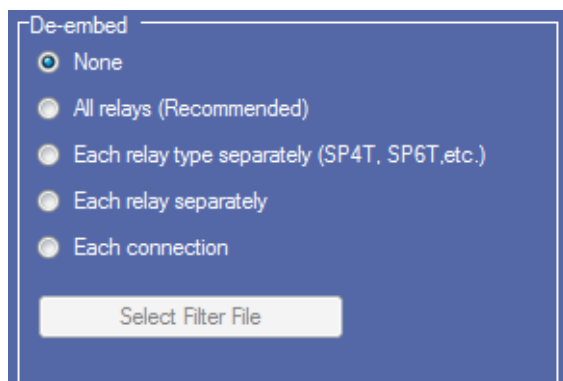
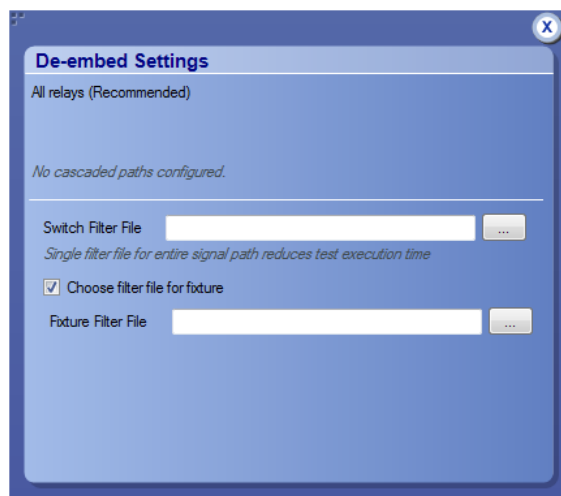



Figure 26: De-embed options

Apply a filter file for all relays

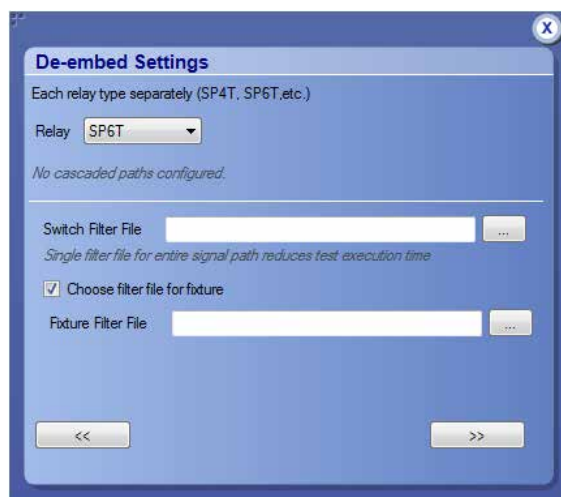
Select to apply a single filter file for all relays.




Click  to browse and select the filter file for the switch. To apply the filter file for the fixture, select **Choose filter file for fixture** and browse the filter file.



Apply a filter file for each relay type separately

Select to separately apply a single filter file for each relay type.



Select the Relay type from the drop-down list; click  to browse and select the filter file for the switch. To apply the filter file for the fixture, select **Choose filter file for fixture** and browse the filter file.



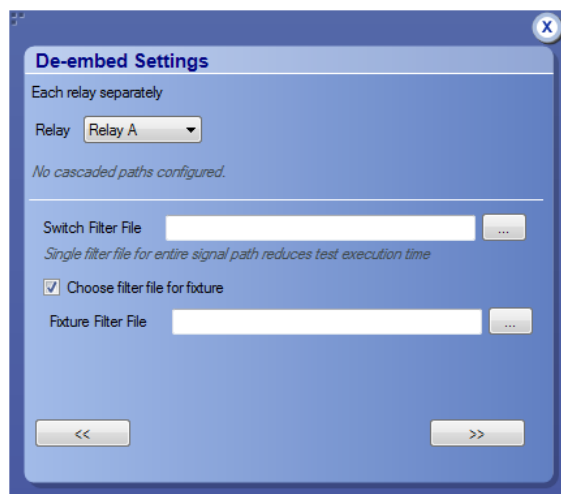
Tip: Click  or  to select the previous or next relay type.



Tip: The selected relay types are highlighted in dark blue in the application.

Apply a filter file for each relay separately

Select to separately apply a filter file for each relay.



Select the Relay from the drop-down list; click ... to browse and select the filter file for the switch. To apply the filter file for the fixture, select **Choose filter file for fixture** and browse the filter file.



Tip: Click << or >> to select the previous or next relay.



Tip: The selected relay is highlighted in dark blue in the application.

Apply a filter file for each connection separately

Select to apply a filter file for each connection.



Select the Relay and the Input from the drop-down list; click ... to browse and select the filter file for the switch. To apply the filter file for the fixture, select **Choose filter file for fixture** and browse the filter file. Select **Choose different filter file for cable** to browse and select the filter file for cable.





Tip: Click << or >> to select the previous or next channel.



Tip: The selected relay signal is highlighted in dark blue in the application.



Note: Clicking  on the last input of a relay selects the first input of the next relay; clicking  on the first input of a relay selects the last input of the previous relay.

Graphical view of switch matrix configuration

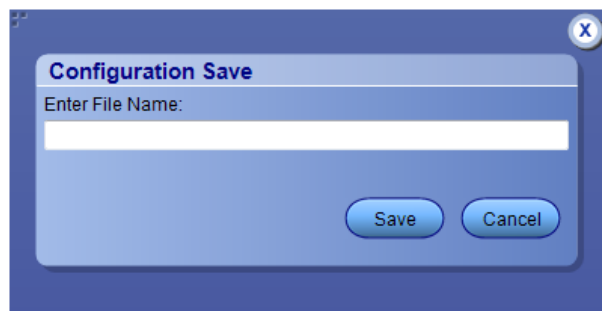
The Graphical view displays the pictorial representation of the switch configuration.

The following figure displays the graphical view of a Keithley switch configuration.



Saving the configuration

Click **Save** in the configuration panel; in the Configuration Save dialog box, enter the file name and click **Save**. The default save path is *C:\ProgramData\Tektronix\Switch Matrix Configurations*.



Note: Save configuration checks whether all the required configurations are done. If any of the required configurations are not selected, then error message is displayed, which prompts you to complete the configuration(s).

Feature description

Link width

Link width determines the number of DUT signals. For example, x8 represents an eight lane DUT.

This works in conjunction with the signal polarity selected for each relay. For example, if the link width is x8, and:

- If the signal polarity is **Positive**, then the signal drop-down list will have selections from Lane0+ to Lane7+.
- If the signal polarity is **Negative**, then the signal drop-down list will have selections from Lane0- to Lane7-.
- If the signal polarity is **Differential**, then the signal drop-down list will have selections from Lane0 to Lane7.

Debug mode

Init Switch

Enter the Switch Address and click **Init Switch** to initialize the switch. This will synchronize the configuration of relay(s) in the application with the relay(s) in the switch. Synchronization will only be successful for those relays that match the physical switch. Pass/Fail status is displayed next to the button.

The factory default GPIB address for Keithley (GPIB0::7::INSTR) and Gigatronics (GPIB0::4::INSTR) is populated in the switch address based on the configured vendor. You can enter the address in GPIB (GPIB0:X:INSTR) or TCPIP (TCPIP::IPADDR::INSTR) format.



Note: Relay configurations (number of relays, number of relay inputs, and name of relays) in the application should match the physical switch, for successful synchronization.

Switch Self-Test

This will close and open all switch channels one-by-one. A selftest report (CSV) is generated at the end of the process. You cannot abort this process.



Note: Initialize the switch before performing the Switch Self-Test.

Reset Switch

Click **Reset Switch** to reset the switch. This will open all channels.

Init Scope

Enter the oscilloscope address in the Scope Address field and click **Init Scope** to initialize the oscilloscope. This will establish the connection with the oscilloscope. The pass/fail status is displayed next to the button.

You can enter the address in GPIB (GPIB0:X:INSTR) or TCPIP (TCPIP::IPADDR::INSTR) format.

When the oscilloscope is initialized and de-embed settings are configured, closing a connection will apply the de-embed settings and then close the connection.



Note: The virtual GPIB address of the oscilloscope is GPIB8::1::INSTR.



Note: If oscilloscope fails to respond to the *IDN? query during initialization, then the connection attempt is considered a failure.

Cascade (Relay cascade)

This feature allows you to cascade the relay by connecting the common channel as an input signal for another relay.

To cascade, select **Cascade** in the relay and select the Relay and Input of the relay. Check that the selected relay signal displays the relay name, specifying that the lane input signal is the output from that relay.

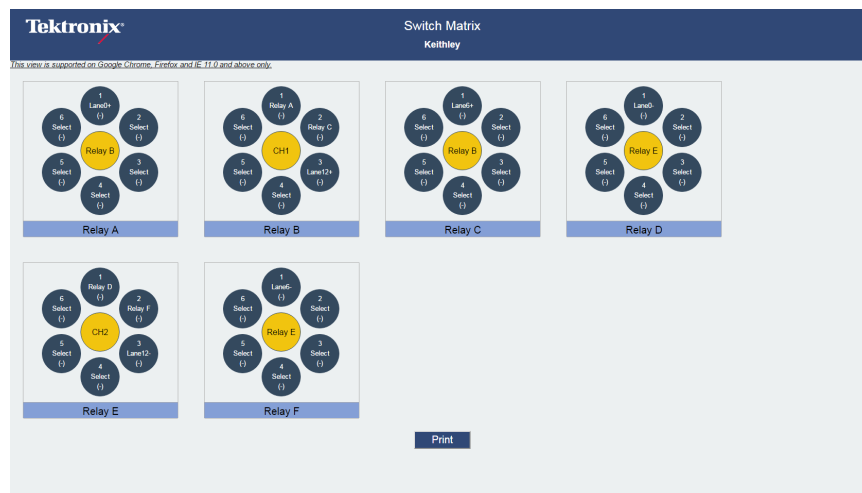
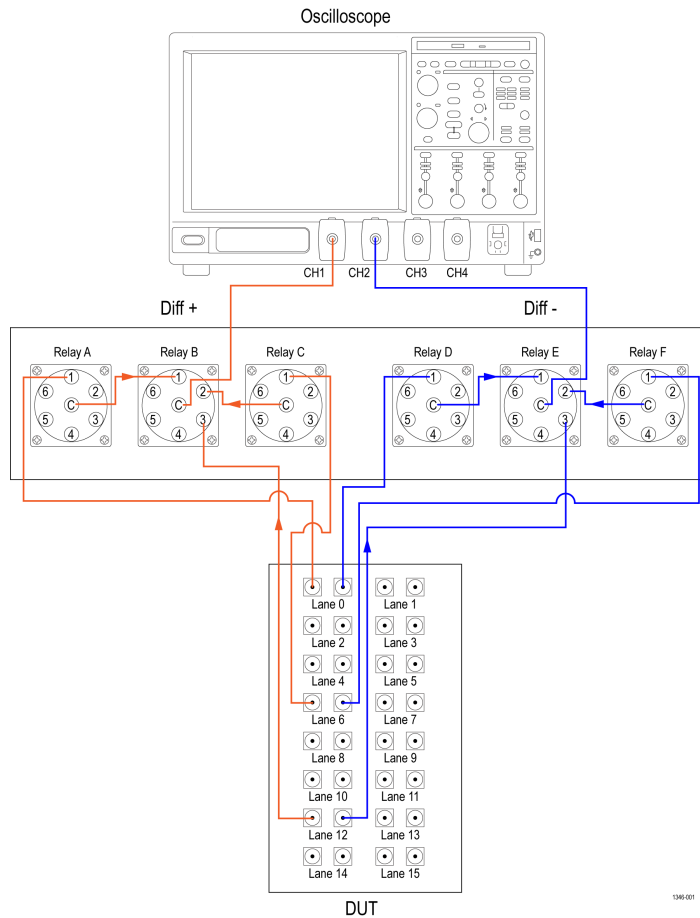


Figure 27: Graphical view of relay cascade configuration



Tip: Switch Matrix application supports only single-level cascading of the relays. For example, if the Relay A output is cascaded to Relay B, then the Relay B output cannot be cascaded.

Error messages

Error message	Possible solution
<p>"A filename cannot be empty and it cannot contain any of the following characters:\n\t. .. \\/ : ? \" < > * ! @ # \$ % ^ & * () - + . , / \\\' < ></p> <p>Also, the file name cannot be \"Keithley S46T\", \"Gigatronics ASCOR 8000\", \"MiniCircuit ZTM6SP4T40\", \"MiniCircuit ZTM28SP6T40\", \"Select\", \"New Configuration\", \"Custom\", \"Auto Detect\" or \"Show All Files\""</p>	
Configure appropriate signals before the de-embed settings.	Select at least one signal for a relay before configuring the de-embed settings.
Either the instrument address is invalid or instrument is not connected.	Check the GPIB connection from oscilloscope to switch and verify the instrument address.
<p>Error occurred while trying to recall the configuration settings.</p> <p>Try re-creating configuration or recalling a different configuration file.</p>	Re-create the configuration file or recall a different configuration file.
Error occurred while trying to access the connection for open/close operation.	
Filter file <FilterFileName> not found.	Reselect the de-embed filter file and try again.
Graphical view is not generated or does not exist.	
Initialize the switch	Initialize the switch and then perform the switch operations.
Instrument address doesn't belong to any supported switch.	Verify the switch address.
Instrument address is empty.	Instrument address cannot be empty. Enter a valid instrument address in the GPIB (<i>GPIB0:X:INSTR</i>) or TCPIP (<i>TCPIP::IPADDR::INSTR</i>) format.
No switch detected. Connect a Keithley or Mini Circuit switch and try auto detection by selecting Configuration > Auto Detect.	Check the GPIB connection from the oscilloscope to switch and whether the instrument is detected in TekVisa.
Number of relays cannot be more than 26	
Please ensure that the name(s) of the configured relay(s) match the ones present on the physical switch.	
Relay name cannot be empty	
Scope initialization failed. Check if the address is valid and ensure that the instrument is switched on and try again.	Validate the oscilloscope address try again.
Switch communication failed...	Ensure that the switch is on. Reset the switch and try again.
Switch initialization failed. Check if the address is valid and ensure that the instrument is switched on and try again.	Validate the switch address and ensure that the instrument is switched on. Try again.
The start count cannot be more than 74	
Timeout Error. Either the command is invalid or instrument is not active.	Check the command syntax and the connection of the instrument by SWITCH:*IDN command.
Two or more lanes have same name. The lane names should be unique.	
Table continued...	

Error message	Possible solution
Two or more relays have same name.	

SCPI Commands

About SCPI command

You can use the Standard Commands for Programmable Instruments (SCPI) to communicate remotely with the TekExpress application. Complete the TCP/IP socket configuration and the TekVISA configuration in the oscilloscope or in the device where you are executing the script.



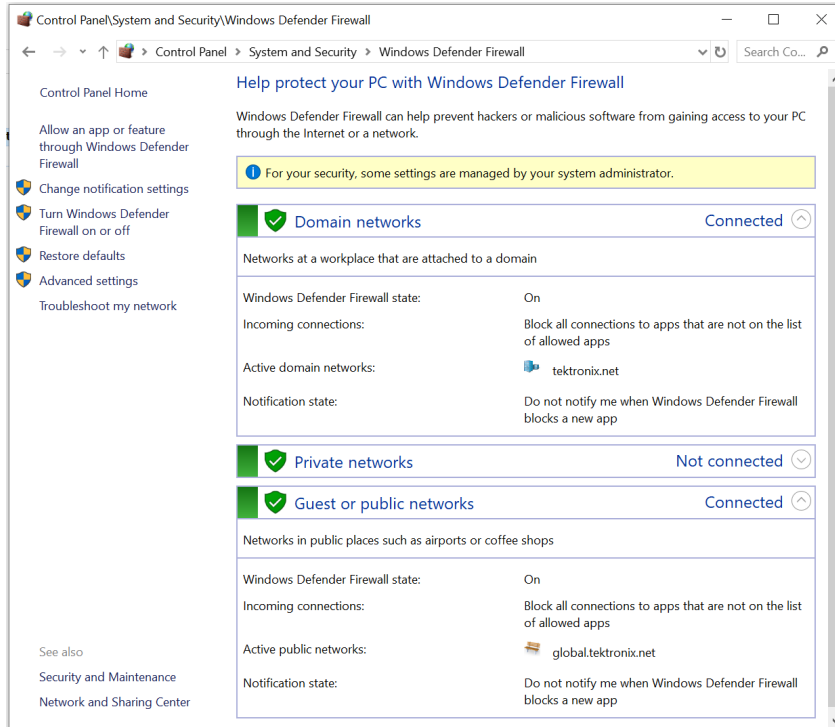
Note: If you are using an external PC to execute the remote interface commands, then install TekVISA in the PC to make the configurations.

Socket configuration for SCPI commands

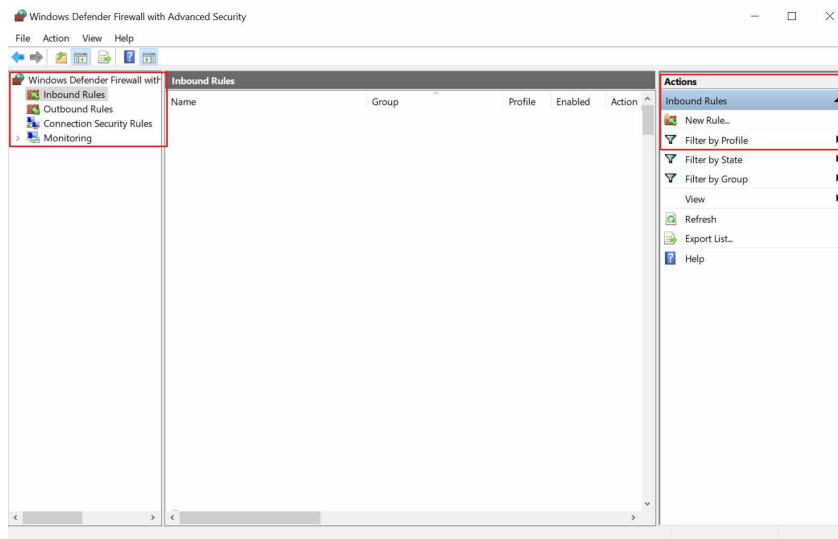
This section describes the steps to configure the TCP/IP socket configuration in your script execution device and the steps to configure the TekVISA configuration in the oscilloscope to execute the SCPI commands.

TCP/IP socket configuration

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

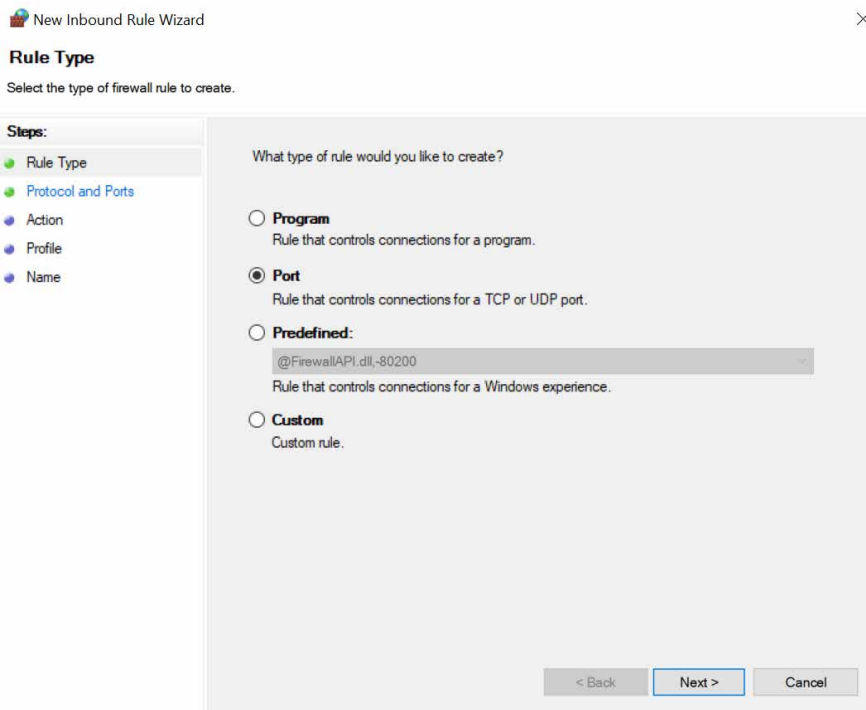


2. In Windows Firewall with Advanced Security menu, select **Windows Firewall with Advanced Security on Local Computer > Inbound Rules** and click **New Rule...**



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**.

New Inbound Rule Wizard

Protocol and Ports

Specify the protocols and ports to which this rule applies.

Steps:

- Rule Type
- Protocol and Ports
- Action
- Profile
- Name

Does this rule apply to TCP or UDP?

☒ TCP
☐ UDP

Does this rule apply to all local ports or specific local ports?

☐ All local ports
☒ Specific local ports:
Example: 80, 443, 5000-5010

< Back Next > Cancel

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

New Inbound Rule Wizard

Action

Specify the action to be taken when a connection matches the conditions specified in the rule.

Steps:

- Rule Type
- Protocol and Ports
- Action
- Profile
- Name

What action should be taken when a connection matches the specified conditions?

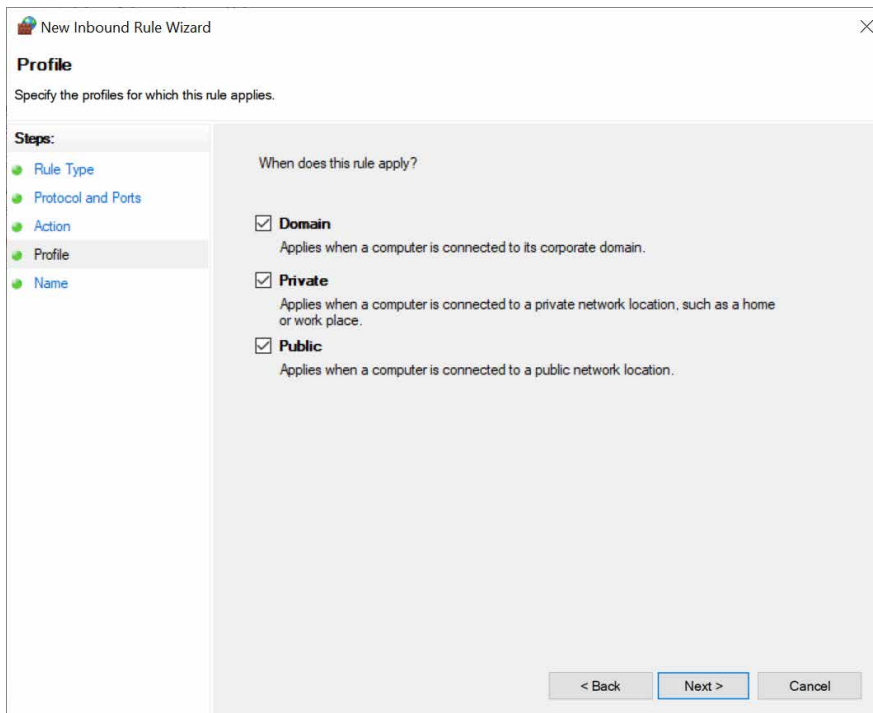
☒ **Allow the connection**
This includes connections that are protected with IPsec as well as those are not.

☐ **Allow the connection if it is secure**
This includes only connections that have been authenticated by using IPsec. Connections will be secured using the settings in IPsec properties and rules in the Connection Security Rule node.
[Customize...](#)

☐ **Block the connection**

< Back Next > Cancel

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



New Inbound Rule Wizard

Profile

Specify the profiles for which this rule applies.

Steps:

- Rule Type
- Protocol and Ports
- Action
- Profile
- Name

When does this rule apply?

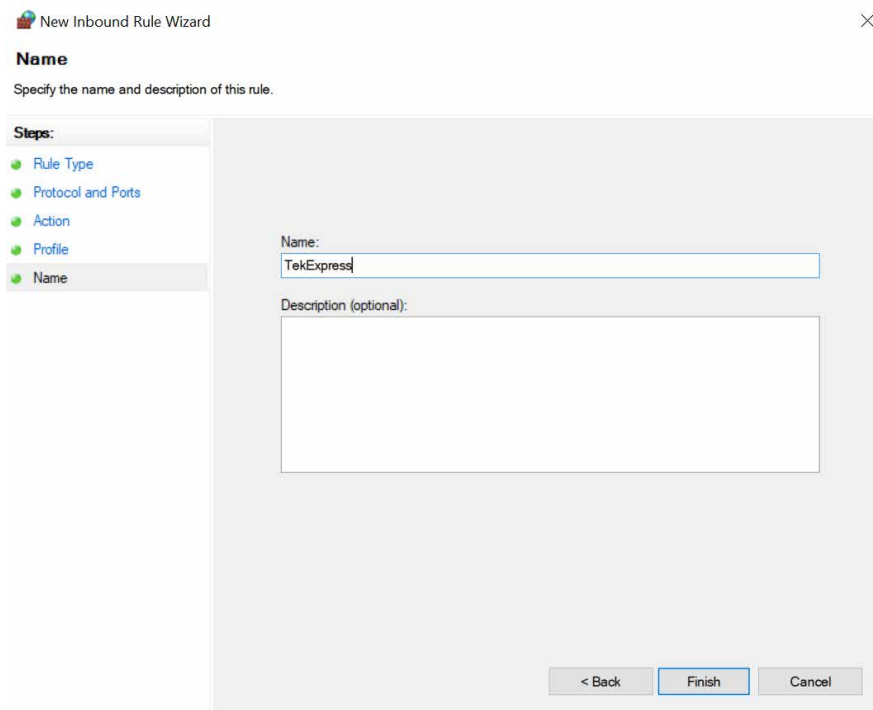
☒ **Domain**
Applies when a computer is connected to its corporate domain.

☒ **Private**
Applies when a computer is connected to a private network location, such as a home or work place.

☒ **Public**
Applies when a computer is connected to a public network location.

< Back Next > Cancel

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



New Inbound Rule Wizard

Name

Specify the name and description of this rule.

Steps:

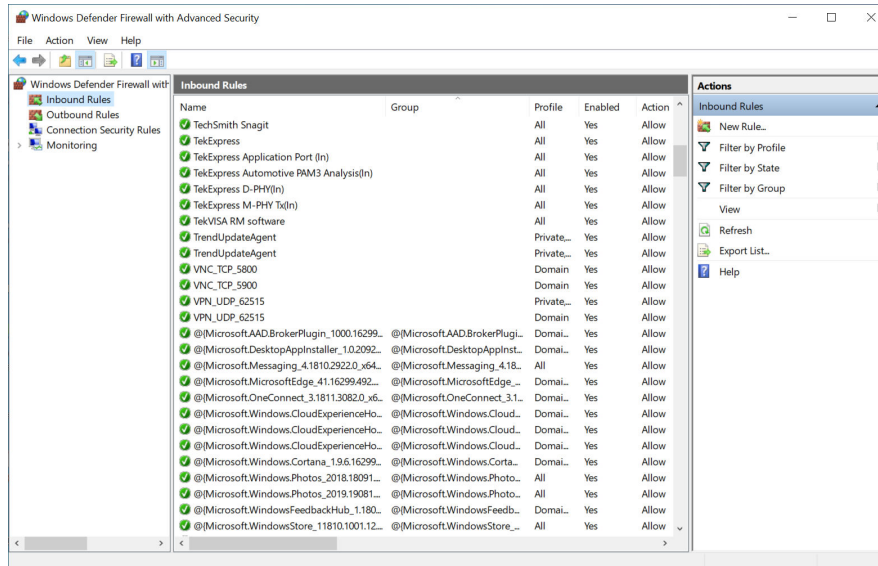
- Rule Type
- Protocol and Ports
- Action
- Profile
- Name

Name:
TekExpress

Description (optional):

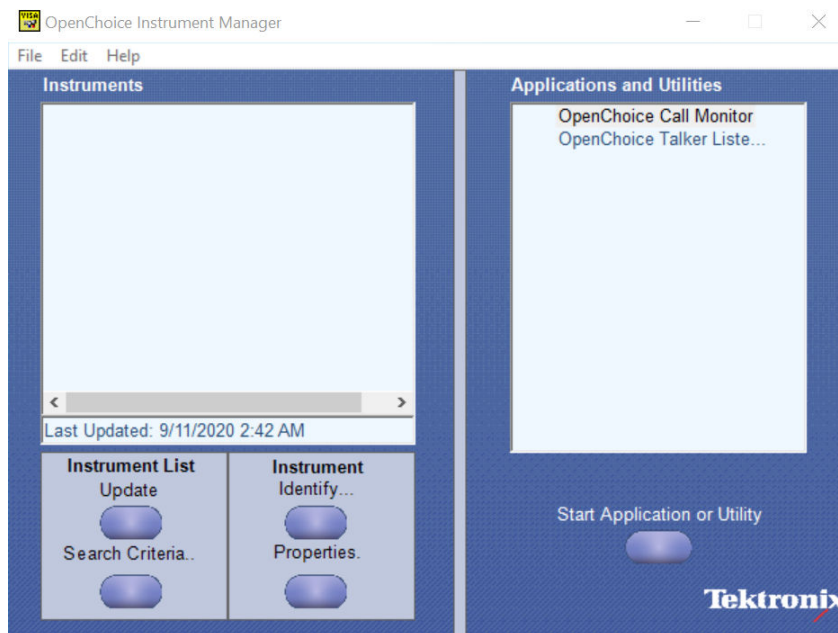
< Back Finish Cancel

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**.



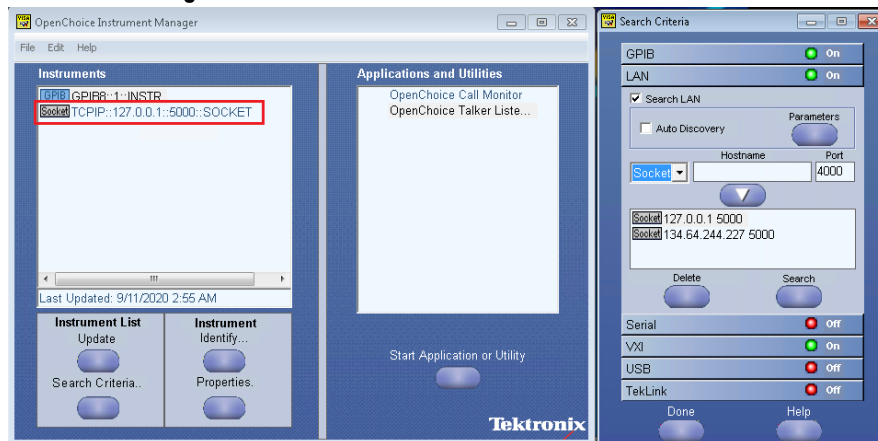
2. Click **Search Criteria**. In **Search Criteria** menu, click **LAN** to Turn-on. Select **Socket** from the drop-down list, enter the IP address of

the TekExpress device in **Hostname** and type **Port** as 5000. Click  to configure the IP address with Port.

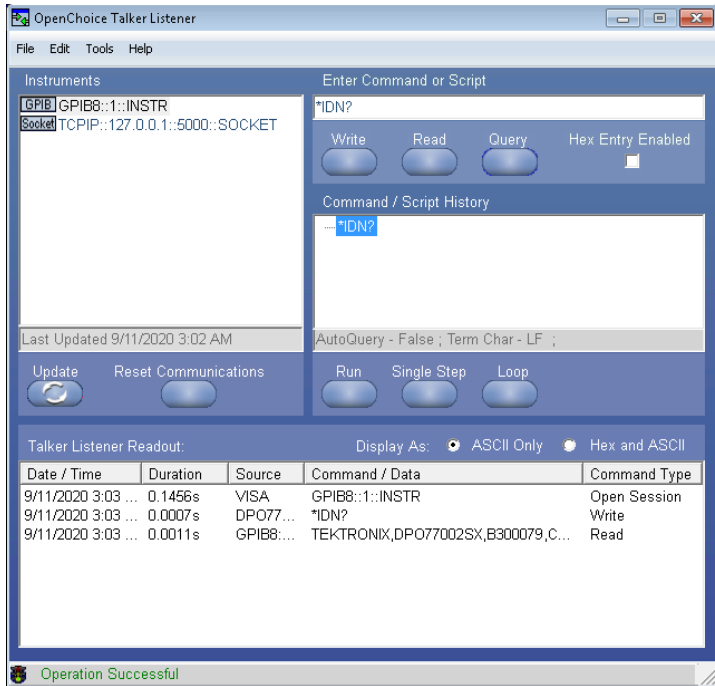
Enter the Hostname as 127.0.0.1 if the TekVISA and TekExpress application are in the same system, else enter the IP address of the oscilloscope where the TekExpress application is running.



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 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

SuiteName
<ul style="list-style-type: none"> For CEM, valid values are System-Board, Add-In-Card For U.2(SFF-8639), valid values are Host, Module For BaseSpec, valid value is TX Test Board and SRIS TX Test Board For M.2, valid values are M2_Add-In-Card and M2_Host For RefClockSpec valid value is Ref Clock

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
Tests for CEM	{True False} or {1 0}
<ul style="list-style-type: none"> Median Peak Jitter Gen1 Min Eye Width Gen1 Min Time Between Crossovers Gen1 Non Transition Eye Diagram Gen1 Peak to Peak Jitter Gen1 RMS Jitter (Per Edge) Gen1 Transition Eye Diagram Gen1 Unit Interval Gen1 Composit Eye Height Gen2 Dj_dd Gen2 Min Eye Width Gen2 Min Time Between Crossovers Gen2 Non Transition Eye Diagram Gen2 Peak to Peak Jitter Gen2 	<p>It represents selected or unselected.</p> <p>Where,</p> <p>True or 1 - Selected</p> <p>False or 0 - Unselected</p>
Table continued...	

TestName	Value
<ul style="list-style-type: none"> • RJ(RMS) Gen2 • TJ @ E-12 Gen2 • Transition Eye Diagram Gen2 • Unit Interval Gen2 • Composit Eye Height Gen3 • Dj_dd Gen3 • Min Eye Width Gen3 • Min Time Between Crossovers Gen3 • Non Transition Eye Diagram Gen3 • Peak to Peak Jitter Gen3 • RJ(RMS) Gen3 • TJ @ E-12 Gen3 • Transition Eye Diagram Gen3 • Unit Interval Gen3 • Composite Eye Height Gen4 • Dj_dd Gen4 • Extrapolated Eye Height Gen4 • Min Eye Width Gen4 • Min Time Between Crossovers Gen4 • Non Transition Eye Diagram Gen4 • Peak to Peak Jitter Gen4 • RJ(RMS) Gen4 • TJ @ E-12 Gen4 • Transition Eye Diagram Gen4 • Uncorrelated PWJ TJ@E-12 Gen4 • Unit Interval Gen4 • Composite EH Gen5 • Composite EW Gen5 	
<ul style="list-style-type: none"> • Deterministic DD Jitter Gen5 • ExtrapolatedJitter Gen5 • Eye Height@BER Gen5 • Eye Width@Ber Gen5 • RandomJitter Gen5 • UnitInterval Gen5 • TIE RJ(RMS) Gen5 • Uncorrelated TIE TJ @E-12 Gen5 • Uncorrelated TIE DJ dd@E-12 Gen5 • Uncorrelated PWJ TJ @E-12 Gen5 • Uncorrelated PWJ DJ dd@E-12 Gen5 	<p>{True False} or {1 0}</p> <p>It represents selected or unselected.</p> <p>Where,</p> <p>True or 1 - Selected</p> <p>False or 0 - Unselected</p>

Table continued...

TestName	Value
Tests for BaseSpec	{True False} or {1 0}
<ul style="list-style-type: none"> AC CM 4GHz Gen3 AC CM 30KHz-500MHz Gen3 DDj Gen3 EIEOS Min Voltage Gen3 F/2 Jitter Gen3 PS21 Ratio Gen3 PWJ RJ (RMS) Gen3 TIE RJ (RMS) Gen3 Uncorrelated PWJ DJ dd@E-12 Gen3 Uncorrelated PWJ TJ@E-12 Gen3 Uncorrelated TIE DJ dd@E-12 Gen3 Uncorrelated TIE TJ @ E-12 Gen3 V Tx_no_eq Gen3 AC CM 8Ghz Gen4 AC CM 30KHz-500MHz Gen4 DDj Gen4 EIEOS Min Voltage Gen4 F/2 Jitter Gen4 PS21 Ratio Gen4 PWJ RJ (RMS) Gen4 TIE RJ (RMS) Gen4 Uncorrelated PWJ DJ dd@E-12 Gen4 Uncorrelated PWJ TJ@E-12 Gen4 Uncorrelated TIE DJ dd@E-12 Gen4 Uncorrelated TIE TJ @ E-12 Gen4 V Tx_no_eq Gen4 AC CM 4GHz Gen5 AC CM 16GHz Gen5 DDj Gen5 EIEOS Min Voltage Gen5 F/2 Jitter Gen5 PS21 Ratio Gen5 PWJ RJ (RMS) Gen5 TIE RJ (RMS) Gen5 Uncorrelated PWJ DJ dd@E-12 Gen5 Uncorrelated PWJ TJ@E-12 Gen5 Uncorrelated TIE DJ dd@E-12 Gen5 Uncorrelated TIE TJ @ E-12 Gen5 	<p>It represents selected or unselected.</p> <p>Where,</p> <p>True or 1 - Selected</p> <p>False or 0 - Unselected</p>
Table continued...	

TestName	Value
<ul style="list-style-type: none"> • V Tx_no_eq Gen5 • RLM_Gen6 • SNDR_Gen6 • Uncorrelated Tie Tj@ E-12 Gen6 • Uncorrelated TIE DJ dd@E-12 Gen6 • TIE RJ(RMS) Gen6 • Uncorrelated PWJ TJ @E-12 Gen6 • Uncorrelated PWJ DJ dd@E-12 Gen6 • PS21Ratio Gen6 • V Tx_Boost Gen6 • AC CM 16Ghz Gen6 • AC CM 30KHz-500MHz Gen6 • V Tx_Diff_Pk_To_Pk Gen6 • V Tx_EIEOS Gen6 	
Tests for U.2 <ul style="list-style-type: none"> • Composit Eye Height Gen3 • Dj_dd Gen3 • Min Eye Width Gen3 • Min Time Between Crossovers Gen3 • Non Transition Eye Diagram Gen3 • Peak to Peak Jitter Gen3 • RJ(RMS) Gen3 • TJ @ E-12 Gen3 • Transition Eye Diagram Gen3 • Unit Interval Gen3 	{True False} or {1 0} It represents selected or unselected. Where, True or 1 - Selected False or 0 - Unselected
Tests for M.2 <ul style="list-style-type: none"> • Composit Eye Height Gen3 • Dj_dd Gen3 • Min Eye Width Gen3 • Min Time Between Crossovers Gen3 • Non Transition Eye Diagram Gen3 • Peak to Peak Jitter Gen3 • RJ(RMS) Gen3 • TJ @ E-12 Gen3 • Transition Eye Diagram Gen3 • Unit Interval Gen3 	{True False} or {1 0} It represents selected or unselected. Where, True or 1 - Selected False or 0 - Unselected
Test for RefClockSpec <ul style="list-style-type: none"> • HF RMS Jitter Gen5 • AC-REFCLK Gen5 	{True False} or {1 0} It represents selected or unselected. Where,

TestName	Value
	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.

VersionName
<ul style="list-style-type: none"> Gen1-1.0a (Applicable for DeviceName = CEM) Gen1-1.1 (Applicable for DeviceName = CEM) Gen2-2.0 (Applicable only DeviceName = CEM) Gen3-3.0 (Applicable only DeviceName = CEM, BaseSpec, U.2(SFF-8639 and M.2) Gen4-4.0 (Applicable only DeviceName = CEM and BaseSpec) Gen5-5.0 (Applicable only DeviceName = CEM, BaseSpec and RefClockSpec) Gen6-6.0 (Applicable only DeviceName = BaseSpec)

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 19: Command arguments for general settings

ParameterName	Value
Value	Specifies the value parameters. <ul style="list-style-type: none"> For InstrumentType, valid values are: <ul style="list-style-type: none"> Comment For DUTID, valid values are: <ul style="list-style-type: none"> Comment
InstrumentType	Specifies the instrument type. Valid values are: <ul style="list-style-type: none"> Alternate Real Time Scope Real Time Scope
DataRate2Gb	<ul style="list-style-type: none"> Included Excluded
DataRate5Gb	<ul style="list-style-type: none"> Included Excluded
DataRate8Gb	<ul style="list-style-type: none"> Included Excluded
DataRate16Gb	<ul style="list-style-type: none"> Included Excluded
DataRate32Gb	<ul style="list-style-type: none"> Included Excluded
DataRate64Gb	<ul style="list-style-type: none"> Included Excluded
PreEmphasis3dB	<ul style="list-style-type: none"> Included Excluded
Table continued...	

ParameterName	Value
PreEmphasis6dB	<ul style="list-style-type: none"> Included Excluded
SSC	<ul style="list-style-type: none"> On Off
VoltageSwing	<ul style="list-style-type: none"> Full Reduced
Link Widths	<ul style="list-style-type: none"> 1 Lane 2 Lanes 4 Lanes 8 Lanes 16 Lanes
SignalPreset8Gb	Signal quality preset selection values are P0, P1, P2, P3, P4, P5, P6, P7, P8, P9, P10. To select multiple signal quality preset, specify as P0_P1_P2
SignalPreset16Gb	
SignalPreset32Gb	
Preset8Gb	Preset selection values are P0_, P1_, P2_, P3_, P4_, P5_, P6_, P7_, P8_, P9_, P10_. To select multiple signal quality preset, specify as P0_P1_P2
Preset16Gb	
Preset32Gb	
Preset64Gb	Preset selection values are Q0_, Q1_, Q2_, Q3_, Q4_, Q5_, Q6_, Q7_, Q8_, Q9_, Q10_. To select multiple signal quality preset, specify as Q0_Q1_Q2
Acquisition	<ul style="list-style-type: none"> BeforeAnalysis AcquireOnly
AcquisitionCountGen4	1 to 10
AcquisitionCountGen5	
SaveOptions	<ul style="list-style-type: none"> Save All the Waveforms Save Only Analyzed Waveform No Waveforms saved - Discard after analysis
DeEmbed2Gb	<ul style="list-style-type: none"> Included Excluded
DeEmbed5Gb	<ul style="list-style-type: none"> Included Excluded
DeEmbed8Gb	<ul style="list-style-type: none"> Included Excluded

Table continued...

ParameterName	Value
DeEmbed16Gb	<ul style="list-style-type: none"> • Included • Excluded
DeEmbed32Gb	<ul style="list-style-type: none"> • Included • Excluded
DeEmbed64Gb	<ul style="list-style-type: none"> • Included • Excluded
Embed8Gb	<ul style="list-style-type: none"> • Included • Excluded
Embed16Gb	<ul style="list-style-type: none"> • Included • Excluded
Embed32Gb	<ul style="list-style-type: none"> • Included • Excluded
Filterfile2Gb	Filterfile2Gb.flr
Filterfile5Gb	Filterfile5Gb.flr
FilterfileDeEmbed8Gb	FilterfileDeEmbed8Gb.flr
FilterfileEmbed8Gb	FilterfileEmbed8Gb.flr
FilterfileDeEmbed16Gb	FilterfileDeEmbed16Gb.flr
FilterfileEmbed16Gb	FilterfileEmbed16Gb.flr
FilterfileDeEmbed32GbPos	FilterfileDeEmbed32GbPos.flr
FilterfileDeEmbed32GbNeg	FilterfileDeEmbed32GbNeg.flr
FilterfileDeEmbed64GbPos	FilterfileDeEmbed64GbPos.flr
FilterfileDeEmbed64GbNeg	FilterfileDeEmbed64GbNeg.flr
FilterfileEmbed32Gb	FilterfileEmbed32Gb.flr
FilterfileDeEmbed32Gb	FilterfileDeEmbed32Gb.flr
EnableDUTAutomation	<ul style="list-style-type: none"> • Included • Excluded
DeskewAutomation	<ul style="list-style-type: none"> • Included • Excluded
Automation Settings	<ul style="list-style-type: none"> • Use Default Settings • Manually Configure Settings • Use Custom Settings
Signal Type	<ul style="list-style-type: none"> • Square • Sine

Table continued...

ParameterName	Value
Gen4DataClockPatternCount	0 to 9
Gen5DataClockPatternCount	0 to 9
RecordLength2Gb	2.5e6
RecordLength5Gb	10e6
RecordLength8Gb	10e6
RecordLength16Gb	20e6
RecordLength32Gb	12.5e6
RecordLength64Gb	12.5e6
SampleRate2Gb	50e9
SampleRate5Gb	50e9
SampleRate8Gb	50e9
SampleRate16Gb	100e9
SampleRate32Gb	200e6
SampleRate64Gb	200e6
Bandwidth2Gb	6e9
Bandwidth5Gb	12.5e9
Bandwidth8Gb	13e9
Bandwidth16Gb	16e9
Bandwidth32Gb	<ul style="list-style-type: none"> • 33e9 (CEM) • 50e9 (Base)
Bandwidth64Gb	50e9
Signal Validation	<ul style="list-style-type: none"> • Prompt me if Signal Check Fails • Skip Test if Signal Check Fails • Turn Off Signal Check

Table continued...

ParameterName	Value
SqSigtestPathGen3	Sigtest file path. Example: C:\Program Files (x86)\SigTest 4.0.51\SigTest.exe
PresetSigtestPathGen3	
SqtestPathGen4	
PresetSigtestPathGen4	
SqtestPathGen5	
PresetSigtestPathGen5	
PHYSigtestPathGen5	
SigtestTemplate2Gbps	
SigtestTemplate5Gbps3Db	
SigtestTemplate5Gbps6Db	
SigtestTemplate8Gbps	
SigtestTemplate16Gbps	
SigtestTemplate32GbpsJitterMeas	
SigtestTemplate32GbpsVoltageMeas	
SigtestTemplate16GbpsPwjTest	
SigtestTemplate32GbpsPHYTest	
SigtestTemplate32GbpsSignalTest	
Include Intermediate Results	<ul style="list-style-type: none"> • Included • Excluded
Awg Clock Setup	<ul style="list-style-type: none"> • Included • Excluded
SRIS SSC	<ul style="list-style-type: none"> • On • Off
SlotNumber	05
Scope Noise Auto Mode	<ul style="list-style-type: none"> • Included • Excluded
CTLE Auto Mode	<ul style="list-style-type: none"> • Included • Excluded
CTLERecordLength	Value: 1.0 to 20.0
OptimalCTLEValue	Value: 0.0 to 15.0
CTLEStepSize	<ul style="list-style-type: none"> • 0.25 • 0.5 • 1.0
Scope Noise Compensation (SNDR)	Value: 0.0 to 20.0
Scope Noise Compensation (TIE Jitter)	Value: 0.0 to 20.0
Table continued...	

ParameterName	Value
Scope Noise Compensation (PWJ)	Value: 0.0 to 20.0
Signal Validation Threshold(mV)	200
Report Update Mode	<ul style="list-style-type: none"> • New • Append • Replace
Trigger Type	<ul style="list-style-type: none"> • Edge • Width • Auto
DUTID Comment	User comment
Timer Warning Info Message Popup	<ul style="list-style-type: none"> • "True" • "False"
Timer Warning Info Message Popup Duration	0 to 20
Timer Error Message Popup	<ul style="list-style-type: none"> • "True" • "False"
Timer Error Message Popup Duration	0 to 20
On Failure Stop and Notify	True or False
Automate with Switch	True or False
DeskewAlertEnabled	True or False
On Failure Stop and Notify	True or False
On Failure Pause	True or False
JitterTestAcquireType (For Basespec Only)	<ul style="list-style-type: none"> • CompliancePattern • DataClockPattern
SigtestSilentMode	True or False
Gen5RefClockData (For RefClockSpecOnly)	True or False
SiliconLabTool (For RefClockSpecOnly)	True or False
Probing Type (For All)	<ul style="list-style-type: none"> • Differential • Single Ended
RecordLengthRefGen5 (For RefClockSpec Only)	80e6
SampleRateRefGen5 (For RefClockSpec Only)	50e9
BandwidthRefGen5 (For RefClockSpec Only)	5e9

Table 20: Command arguments for report settings

ParameterName	Value
Report Update Mode	<ul style="list-style-type: none"> • New • Append • Replace
Report Path	X:\<application name>\Reports\DUT001.mht
Save As Type	<ul style="list-style-type: none"> • 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, <ul style="list-style-type: none"> • True or 1 - Selected • False or 0 - Unselected
Create report at the end	{True False} or {1 0} It represents selected or unselected. Where, <ul style="list-style-type: none"> • True or 1 - Selected • False or 0 - Unselected
Include Pass/Fail Results Summary	{True False} or {1 0} It represents selected or unselected. Where, <ul style="list-style-type: none"> • True or 1 - Selected • False or 0 - Unselected
Include Detailed Results	{True False} or {1 0} It represents selected or unselected. Where, <ul style="list-style-type: none"> • True or 1 - Selected • False or 0 - Unselected
Include Plot Images	{True False} or {1 0} It represents selected or unselected. Where, <ul style="list-style-type: none"> • True or 1 - Selected • False or 0 - Unselected

Table continued...

ParameterName	Value
Include Setup Configuration	{True False} or {1 0} It represents selected or unselected. Where, <ul style="list-style-type: none"> • True or 1 - Selected • False or 0 - Unselected
CXL Report Selection	<ul style="list-style-type: none"> • Included • Excluded
Include Complete Application Configuration	{True False} or {1 0} It represents selected or unselected. Where, <ul style="list-style-type: none"> • True or 1 - Selected • False or 0 - Unselected
Include User Comments	{True False} or {1 0} It represents selected or unselected. Where, <ul style="list-style-type: none"> • 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.

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>	<ul style="list-style-type: none"> • CEM • BaseSpec • RefClockSpec • U.2(SFF-8639) • M.2 	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
Tests for CEM	<ul style="list-style-type: none"> • Median Peak Jitter Gen1 • Min Eye Width Gen1 • Min Time Between Crossovers Gen1 • Non Transition Eye Diagram Gen1 • Peak to Peak Jitter Gen1 • RMS Jitter (Per Edge) Gen1 • Transition Eye Diagram Gen1

Table continued...

TestName	String
	<ul style="list-style-type: none"> • Unit Interval Gen1 • Composit Eye Height Gen2 • Dj_dd Gen2 • Min Eye Width Gen2 • Min Time Between Crossovers Gen2 • Non Transition Eye Diagram Gen2 • Peak to Peak Jitter Gen2 • RJ(RMS) Gen2 • TJ @ E-12 Gen2 • Transition Eye Diagram Gen2 • Unit Interval Gen2 • Composit Eye Height Gen3 • Dj_dd Gen3 • Min Eye Width Gen3 • Min Time Between Crossovers Gen3 • Non Transition Eye Diagram Gen3 • Peak to Peak Jitter Gen3 • RJ(RMS) Gen3 • TJ @ E-12 Gen3 • Transition Eye Diagram Gen3 • Unit Interval Gen3 • Composite Eye Height Gen4 • Dj_dd Gen4 • Extrapolated Eye Height Gen4 • Min Eye Width Gen4 • Min Time Between Crossovers Gen4 • Non Transition Eye Diagram Gen4 • Peak to Peak Jitter Gen4 • RJ(RMS) Gen4 • TJ @ E-12 Gen4 • Transition Eye Diagram Gen4 • Uncorrelated PWJ TJ@E-12 Gen4 • Unit Interval Gen4 • Composite EH Gen5 • Composite EW Gen5 • Deterministic DD Jitter Gen5 • ExtrapolatedJitter Gen5 • Eye Height@BER Gen5 • Eye Width@Ber Gen5

Table continued...

TestName	String
	<ul style="list-style-type: none"> • RandomJitter Gen5 • UnitInterval Gen5 • TIE RJ (RMS) Gen5 • Uncorrelated PWJ DJ dd@E-12 Gen5 • Uncorrelated PWJ TJ@E-12 Gen5 • Uncorrelated TIE DJ dd@E-12 Gen5 • Uncorrelated TIE TJ @ E-12 Gen5
Tests for BaseSpec	<ul style="list-style-type: none"> • AC CM 4GHz Gen3 • AC CM 30KHz-500MHz Gen3 • DDj Gen3 • EIEOS Min Voltage Gen3 • F/2 Jitter Gen3 • PS21 Ratio Gen3 • PWJ RJ (RMS) Gen3 • TIE RJ (RMS) Gen3 • Uncorrelated PWJ DJ dd@E-12 Gen3 • Uncorrelated PWJ TJ@E-12 Gen3 • Uncorrelated TIE DJ dd@E-12 Gen3 • Uncorrelated TIE TJ @ E-12 Gen3 • V Tx_no_eq Gen3 • AC CM 8Ghz Gen4 • AC CM 30KHz-500MHz Gen4 • DDj Gen4 • EIEOS Min Voltage Gen4 • F/2 Jitter Gen4 • PS21 Ratio Gen4 • PWJ RJ (RMS) Gen4 • TIE RJ (RMS) Gen4 • Uncorrelated PWJ DJ dd@E-12 Gen4 • Uncorrelated PWJ TJ@E-12 Gen4 • Uncorrelated TIE DJ dd@E-12 Gen4 • Uncorrelated TIE TJ @ E-12 Gen4 • V Tx_no_eq Gen4 • AC CM 4GHz Gen5 • AC CM 16GHz Gen5 • DDj Gen5 • EIEOS Min Voltage Gen5 • F/2 Jitter Gen5 • PS21 Ratio Gen5

Table continued...

TestName	String
	<ul style="list-style-type: none"> • PWJ RJ (RMS) Gen5 • TIE RJ (RMS) Gen5 • Uncorrelated PWJ DJ dd@E-12 Gen5 • Uncorrelated PWJ TJ@E-12 Gen5 • Uncorrelated TIE DJ dd@E-12 Gen5 • Uncorrelated TIE TJ @ E-12 Gen5 • V Tx_no_eq Gen5 • UnitInterval Gen6 • RLM Gen6 • SNDR Gen6 • Uncorrelated Tie Tj@ E-06 Gen6 • Uncorrelated TIE DJ dd@E-06 Gen6 • TIE RJ(RMS) Gen6 • Uncorrelated PWJ TJ @E-06 Gen6 • Uncorrelated PWJ DJ dd@E-06 Gen6 • PS21Ratio Gen6 • V Tx_Boost Gen6 • AC CM 16Ghz Gen6 • AC CM 30KHz-500MHz Gen6 • V Tx_Diff_Pk_To_Pk Gen6 • V Tx_EIEOS Gen6
Tests for U.2	<ul style="list-style-type: none"> • Composit Eye Height Gen3 • Dj_dd Gen3 • Min Eye Width Gen3 • Min Time Between Crossovers Gen3 • Non Transition Eye Diagram Gen3 • Peak to Peak Jitter Gen3 • RJ(RMS) Gen3 • TJ @ E-12 Gen3 • Transition Eye Diagram Gen3 • Unit Interval Gen3
Tests for M.2	<ul style="list-style-type: none"> • Composit Eye Height Gen3 • Dj_dd Gen3 • Min Eye Width Gen3 • Min Time Between Crossovers Gen3 • Non Transition Eye Diagram Gen3 • Peak to Peak Jitter Gen3 • RJ(RMS) Gen3

Table continued...

TestName	String
	<ul style="list-style-type: none"> • TJ @ E-12 Gen3 • Transition Eye Diagram Gen3 • Unit Interval Gen3
Test for RefClockSpec	<ul style="list-style-type: none"> • RMS Jitter Gen5 • AC-REFCLK Gen5 ¹¹

Returns

<String>

Examples

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

Query the available version names of the application

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

Syntax

TEKEXP:LIST? VERSION (Query)

Returns

<String>

Examples

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

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

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

Syntax

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

Command argument

Argument Name	Argument value
<InstrumentType>	<String>

Returns

<String>

Examples

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

¹¹ Supported in Skyworks Clock Jitter Tool.

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:\PCI Express\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:\PCI Express\Untitled Session\DUT001\20200916_041609\Iter1_Short Record-length for SCOPE Period_NoSSC_DIFF.png";22794,"X:\PCI Express\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.

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.

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>	<ul style="list-style-type: none"> 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>	<ul style="list-style-type: none"> COMPLIANCE USER-DEFINED

Returns

COMPLIANCE | USER-DEFINED

Examples

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

TEKEXP:MODE? command returns the current execution mode.

Generate the report for the current session

This command generates the report for the current session.

Syntax

TEKEXP:REPORT GENERATE(Set)

Arguments

N/A

Examples

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

Query the value of specified report header field in the report

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

Syntax

TEKEXP:REPORT? "<Device Field>" (Query)

Command arguments

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

Setup Information			
DUT ID	DUT001	Probe1 Model	"1X"
Date/Time	2020-10-22 11:24:39	Probe1 Serial Number	"N/A"
Device Type	TX-Device	Probe2 Model	"1X"
TekExpress Application Version	5.2.999.17 (B4L10)	Probe2 Serial Number	"N/A"
TekExpress Framework Version	5.2.999.17_INTERNAL	Probe3 Model	"1X"
Spec Version	Spec 1.0	Probe3 Serial Number	"N/A"
Overall Compliance Mode	Yes	Probe4 Model	"1X"
Overall Test Result	Pass	Probe4 Serial Number	"N/A"
		Scope Model	DPO5104
		Scope Serial Number	Not-Set
		SPC_FactoryCalibration	NOT_UNCAL
		Scope FW Version	10.0.1 Build 25
		DPO5ET Version	10.1.0.64

Returns

<String>

Examples

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

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

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

Syntax

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

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

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

Command arguments

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

This command saves the setup.

Syntax

TEKEXP:SETUP Save(Set)

Examples

TEKEXP:SETUP Save command saves the setup.

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>	<ul style="list-style-type: none">• 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:POPOP? (Query)

TEKEXP:POPOP "<PopupResponse>" (Set)

Command arguments

Argument Name	Argument value
<PopupResponse>	<ul style="list-style-type: none">• Yes• No

Returns

The pop-up details return in the following format:

```
"<Title>","<message>","<response1>,<response2>".
```

Where,

```
<Title> :: <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.

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.

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>,<AcquireType> (Query)
```

Returns

```
<String>
```

Examples

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

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

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, <ul style="list-style-type: none"> • 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 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, <ul style="list-style-type: none"> 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.

Returns the report as XML string

This command returns the report as XML string.

Syntax

TEKEXP:REPORTASXML? (Query)

Returns

<String>

Examples

TEKEXP:REPORTASXML? command returns the report XML string.

Copies all the images from current run session to the given destination location

This command copies all the images from current run session to the given destination location.

Syntax

TEKEXP:COPYIMAGES <DestinationPath> (Set)

Command argument

<DestinationPath> :: <String>

Returns

NA

Examples

TEKEXP:COPYIMAGES C:\Temp command copies all the images from current run session to the mentioned location.

Selects the specified test(s) and deselect all other tests

This command selects the specified test(s) and deselect all other tests.

Syntax

TEKEXP:SELECTID <"TestID"> (Set)

Command argument

Argument Name	Argument value
TestID	String

Returns

NA

Examples

TEKEXP:SELECTID "11101" This command select the test associated with the ID and deselects all other tests in the application.

TEKEXP:SELECTID "11101, 11102" This command selects the tests associated with the IDs and other tests will be deselected.

Returns the complete information about the selected test

This command returns the complete information about the selected test.

The information includes application name, TestID, Device selected, Suite selected, version, Test name, Test description.

Syntax

TEKEXP:TESTINFO? (Query)

Returns

<String>

Examples

TEKEXP:TESTINFO? This command returns the following details:

<TekExpress> <Test Id="11101" Device="TX-Device" Suite="Group1" Version="Spec 1.0" Name="Algorithm Library Measurement" Description="This is Algorithm Library measurement test. Refer Section-B of TekExpress SampleApp Development Guide for more details.

Set the default session

Sets the application configurations to default value.

Syntax

TEKEXP:SESSION DEFAULT (set)

Examples

TEKEXP:SESSION DEFAULT, sets the application configurations to default value.

Save the run/config sessions

Enter the name to save/config the session.

Syntax

TEKEXP:SESSION SAVE, "Session Name" (set)

Command arguments

Argument Name	Argument value
<Session Name>	<String>

Examples

TEKEXP:SESSION SAVE, "Session Name" saves the session.

Load the run/config session

Load the selected config/run session.

Syntax

TEKEXP:SESSION LOAD, "Session Name" (set)

Command arguments

Argument Name	Argument value
<Session Name>	<String>

Examples

TEKEXP:SESSION LOAD, "Session Name", load the selected config/run session.

Delete the run/config session

Deletes the selected config/run session.

Syntax

TEKEXP:SESSION DELETE, "Session1, Session2" (set)

Command arguments

Argument Name	Argument value
<Session Name>	<String>

Examples

TEKEXP:SESSION DELETE, "Session1, Session2", deletes the selected config/run session.

Run the run/config saved session

Run the selected config/run session.

Syntax

TEKEXP:SESSION RUN, "Session Name's separated by comma" (set)

Command arguments

Argument Name	Argument value
<Session Name>	<String>
Session Name's separated by comma (to run the multiple run sessions)	<String>

Examples

TEKEXP:SESSION RUN, "Session Name's separated by comma", runs the selected config/run session.

Query the available list in the run/config session

Returns the list of available config/run session.

Syntax

TEKEXP:SESSION? LIST

Returns

Returns the list of available config/run session.

Examples

TEKEXP:SESSION? LIST, returns the list of available config/run session.

Query the current run/config session

Returns the selected config/run session.

Syntax

TEKEXP:SESSION? CURRENT

Returns

Returns the selected config/run session.

Examples

TEKEXP:SESSION? CURRENT, returns the selected config/run session.

Override the run/config session

Overrides the selected config/run session.

Syntax

TEKEXP:SESSION SAVE, "SessionName", "True" (set)

Command arguments

Argument Name	Argument Type	Argument Value
<Session Name>	<String>	{True False} or {1 0} It represents enabled or disabled. Where, <ul style="list-style-type: none"> • True or 1 - enabled • False or 0 - disabled

Returns

{True | False} or {0 | 1}

Examples

TEKEXP:SESSION SAVE, "SessionName", "True", overrides the selected config/run session.

Exit or close the application

The command exits or close the application

Syntax

TEKEXP:EXIT(Set)

Examples

TEKEXP:EXIT command close the application.

Examples

```
import sys
from time import sleep
import platform
import os
import traceback
import socket_instrument
import csv
_dutId = 'Test DUTID'
_deviceName = "CEM"
_suiteName = "Add-In-Card"
_versionName = "Gen1 - 1.1"
[_param, _value] = ['Signal Validation', 'Turn Off Signal Check']
_measList = ['Unit Interval Gen1']
#No need to change the IP address as it is running on same machine
ipAddress = "localhost"
```

```

si = socket_instrument.SocketInstrument(ipAddress, 5000)
print si.instId
# Set DUTID
si.write('TEKEXP:VALUE DUTID,{0!s}'.format(_dutId))
print si.query('TEKEXP:VALUE? DUTID')
# Set device
si.write('TEKEXP:SELECT DEVICE,{0!s}'.format(_deviceName))
while si.query('TEKEXP:SELECT? DEVICE') != '{}'.format(_deviceName):
    sleep(1)
print si.query('TEKEXP:SELECT? DEVICE')
# Set test suite
si.write('TEKEXP:SELECT SUITE,{0!s}'.format(_suiteName))
while si.query('TEKEXP:SELECT? SUITE') != '{}'.format(_suiteName):
    sleep(1)
print si.query('TEKEXP:SELECT? SUITE')
# Set test version
si.write('TEKEXP:SELECT VERSION,{0!s}'.format(_versionName))
while si.query('TEKEXP:SELECT? VERSION') != '{}'.format(_versionName):
    sleep(1)
print si.query('TEKEXP:SELECT? VERSION')
# Set Signal Validation to 'Turn Off'
si.write('TEKEXP:VALUE GENERAL,{0!s},{1!s}'.format(_param, _value))
print si.query('TEKEXP:VALUE? GENERAL,{0!s}'.format(_param))
# Assign Test name
si.write('TEKEXP:SELECT TEST,ALL,FALSE')
sleep(2)
for _meas in _measList:
    si.write('TEKEXP:SELECT TEST,{0!s},TRUE'.format(_meas))
    sleep(2)
selectedMeasurements = si.query('TEKEXP:SELECT? TEST')
selectedMeasurements = selectedMeasurements.replace('"', '').split(',')
#print 'Selected Measurements'
#for meas in selectedMeasurements:
#print meas
# if any General Parameters User want to modify can be done here
# Execution Starts

```

```

"""Execution function with popup handling"""
appStatus = si.query('TEKEXP:STATE?')
if appStatus == 'READY':
    si.write('TEKEXP:STATE RUN')
    while str(si.query('TEKEXP:STATE?')) != 'RUNNING':
        sleep(1)
    appStatus = si.query('TEKEXP:STATE?')
    try:
        while str(appStatus) != 'READY':
            appStatus = si.query('TEKEXP:STATE?')
            if appStatus in ['RUNNING']:
                sleep(2)
            print('Application Status: {}'.format(appStatus))
            if appStatus in ['WAIT', 'ERROR']:
                print('\n-----')
                print('Application Status: {} Message'.format(appStatus))
                info = str(si.query('TEKEXP:POPUP?'))
                [Title, Message, Responses] = info.split(';')
                ResponseOptions = str(Responses[12:-1]).strip('')
                ResponseOptions = ResponseOptions.split(',')
                print('\n\n'+Title+'\n\n'+Message+'\n')
                print("-----")
                for res in ResponseOptions:
                    print str(ResponseOptions.index(res)) + ' > ' + res
                userResponse = int(input('Choose your option: '))
                si.write('TEKEXP:POPUP "{}"'.format(ResponseOptions[userResponse]))
                print('\nResponse Sent: "{}"'.format(ResponseOptions[userResponse]))
                print("-----")
                print("***** EXECUTION COMPLETED *****")
            except Exception:
                print("Exception Occured")
        # Get the Measurement Results
        allDetailsList = list()
        allValuesList = list()
        allMarginList = list()
        for meas in _measList:#selectedMeasurements:

```

```
allDetailsList = (si.query("TEKEXP:RESULT? \"{0!s}\", \"{1!s}\".format(meas, 'Details'))).replace("", "").split(',')
allValuesList = (si.query("TEKEXP:RESULT? \"{0!s}\", \"{1!s}\".format(meas, 'Value'))).replace("", "").split(',')
allMarginList = (si.query("TEKEXP:RESULT? \"{0!s}\", \"{1!s}\".format(meas, 'Margin'))).replace("", "").split(',')
results = zip(allDetailsList, allValuesList, allMarginList)

# Define local variables
testResultList = list()
details = list()
values = list()
margines = list()

# Header Info for the CSV file
header1CSV=["Detail"]
header2CSV=["Value"]
header3CSV=["Margin"]
header=zip(header1CSV,header2CSV,header3CSV)
testResultList.append(header)

# Conversion to suitable for CSV formatting
testResultList.append(results)

# Open a CSV file object
csvFilePath = "C:\\Test_PCI_Results.csv"
csvFilObj = open(csvFilePath,"wb")

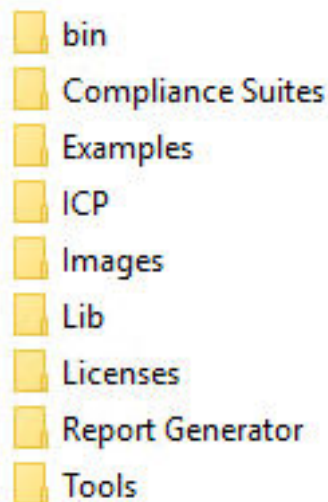
# writing CSV file with the statistical values
mywriter=csv.writer(csvFilObj)
for rowVal in testResultList:
    mywriter.writerow(rowVal)

# Closing the CSV file object
csvFilObj.close()
si.disconnect()
```

References

Application directories

You can find the application files at *C:\Program Files\Tektronix\TekExpress PCI Express*. The application directory and associated files are organized as follows:



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

Table 21: 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 PCI Express software uses the following file name extensions:

Table 22: File name extension

File name extension	Description
*.TekX	Application session files (the extensions may not be displayed)
*.py	Python sequence file.

Table continued...

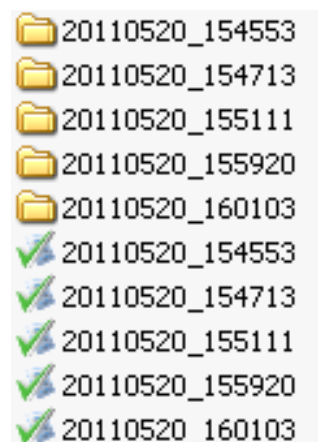
File name extension	Description
*.xml	Test-specific configuration information (encrypted) files. Application log files
*.csv	Test result reports Plot data
*.mht	Test result reports (default) Test reports can also be saved in HTML format
*.pdf	Test result reports Application help document
*.xslt	Style sheet used to generate reports
*.png	Captured images
.wfm	Test waveform file

View test-related files

Files related to tests are stored in My Documents\TekExpress PCI Express\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:\TekExpress PCI Express. 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.

De-embed using filter files

TekExpress PCIe provides an option to de-embed the signal path using filter files. You create the filter files. The filter files are .flt files composed of de-embed filter coefficients for a particular sampling rate. A filter file created for one sampling rate might not work for other sampling rates, so it is important to understand at what sampling rate the measurements are being performed.

Also, the de-embedding filters might differ based on the type of input. For example, if a single ended input is made using a matched SMA cable pair, a filter file for de-embedding a single SMA cable must be provided, since matched SMA cables mostly have similar s-parameters. So in this case, the same filter file is used to de-embed the SMA cable pair.

The maximum sampling rate provided on any channel combination on MSO/DPO/DSA70000/C/D/DX series oscilloscopes is 50 GS/s in realtime mode. The maximum sampling rate provided on Ch1-Ch3 and Ch2-Ch4 channel combinations on MSO/DPO/DSA70000C/D/DX/SX series oscilloscopes is 100 GS/s, provided only 2 channels are on at a given time.

See also

[Common test parameters and values](#)

[Configuration test parameters](#)

Setup files

TekExpress PCI Express package contains setup files (*.TekX) which can be used at PCI-SIG workshop for compliance tests.

Table 23: Setup files configuration details

Setup files (*.TekX)	Configuration details (exclusively used in Gen1/2/3 Gold Suite of PCI-SIG Work Shop (WS))
Compliance_CEM_AIC_x1	<ul style="list-style-type: none"> • Specification - CEM • Device Type - Add-In-Card • Version - Gen3 - 3.0 • Data Rates - 2.5 Gbps, 5 Gbps (Tx equalization 3.5dB, 6 dB) and 8 Gbps • Signal Quality Preset Selection - P0, P7 and P8 for L0 and All Presets from P0 to P10 for Lane0 • Link Width - 1 Lane (Selected test lane: L0) • Automated DUT Control - unchecked • Signal Validation - Pattern Decoding
Compliance_CEM_AIC_x2	<ul style="list-style-type: none"> • Specification - CEM • Device Type - Add-In-Card • Version - Gen3 - 3.0 • Data Rates - 2.5 Gbps, 5 Gbps (Tx equalization 3.5dB, 6 dB) and 8 Gbps • Signal Quality Preset Selection - P0, P7 and P8 for L0 and All Presets from P0 to P10 for Lane0 • Link Width - 2 Lanes (Selected test lane: L0) • Automated DUT Control - unchecked • Signal Validation - Pattern Decoding

Table continued...

Setup files (*.TekX)	Configuration details (exclusively used in Gen1/2/3 Gold Suite of PCI-SIG Work Shop (WS))
Compliance_CEM_AIC_x4	<ul style="list-style-type: none"> • Specification - CEM • Device Type - Add-In-Card • Version - Gen3 - 3.0 • Data Rates - 2.5 Gbps, 5 Gbps (Tx equalization 3.5dB, 6 dB) and 8 Gbps • Signal Quality Preset Selection - P0, P7 and P8 for L0 and All Presets from P0 to P10 for Lane0 • Link Width - 4 Lanes (Selected test lane: L0, L03) • Automated DUT Control - unchecked • Signal Validation - Pattern Decoding
Compliance_CEM_AIC_x8	<ul style="list-style-type: none"> • Specification - CEM • Device Type - Add-In-Card • Version - Gen3 - 3.0 • Data Rates - 2.5 Gbps, 5 Gbps (Tx equalization 3.5dB, 6 dB) and 8 Gbps • Signal Quality Preset Selection - P0, P7 and P8 for L0 and All Presets from P0 to P10 for Lane0 • Link Width - 8 Lanes (Selected test lane: L0, L03, L07) • Automated DUT Control - unchecked • Signal Validation - Pattern Decoding
Compliance_CEM_AIC_x16	<ul style="list-style-type: none"> • Specification - CEM • Device Type - Add-In-Card • Version - Gen3 - 3.0 • Data Rates - 2.5 Gbps, 5 Gbps (Tx equalization 3.5dB, 6 dB) and 8 Gbps • Signal Quality Preset Selection - P0, P7 and P8 for L0 and All Presets from P0 to P10 for Lane0 • Link Width - 16 Lanes (Selected test lane: L0, L07, L15) • Automated DUT Control - unchecked • Signal Validation - Pattern Decoding
Compliance_CEM_SYB_x1	<ul style="list-style-type: none"> • Specification - CEM • Device Type - Add-In-Card • Version - Gen3 - 3.0 • Data Rates - 2.5 Gbps, 5 Gbps (Tx equalization 3.5dB, 6 dB) and 8 Gbps • Signal Quality Preset Selection - P0, P7 and P8 for L0 and All Presets from P0 to P10 for Lane0 • Link Width - 1 Lane (Selected test lane: L0) • Automated DUT Control - unchecked • Signal Validation - Pattern Decoding

Table continued...

Setup files (*.TekX)	Configuration details (exclusively used in Gen1/2/3 Gold Suite of PCI-SIG Work Shop (WS))
Compliance_CEM_SYB_x2	<ul style="list-style-type: none"> • Specification - CEM • Device Type - Add-In-Card • Version - Gen3 - 3.0 • Data Rates - 2.5 Gbps, 5 Gbps (Tx equalization 3.5dB, 6 dB) and 8 Gbps • Signal Quality Preset Selection - P0, P7 and P8 for L0 and All Presets from P0 to P10 for Lane0 • Link Width - 2 Lanes (Selected test lane: L0) • Automated DUT Control - unchecked • Signal Validation - Pattern Decoding
Compliance_CEM_SYB_x4	<ul style="list-style-type: none"> • Specification - CEM • Device Type - Add-In-Card • Version - Gen3 - 3.0 • Data Rates - 2.5 Gbps, 5 Gbps (Tx equalization 3.5dB, 6 dB) and 8 Gbps • Signal Quality Preset Selection - P0, P7 and P8 for L0 and All Presets from P0 to P10 for Lane0 • Link Width - 4 Lanes (Selected test lane: L0, L03) • Automated DUT Control - unchecked • Signal Validation - Pattern Decoding
Compliance_CEM_SYB_x8	<ul style="list-style-type: none"> • Specification - CEM • Device Type - Add-In-Card • Version - Gen3 - 3.0 • Data Rates - 2.5 Gbps, 5 Gbps (Tx equalization 3.5dB, 6 dB) and 8 Gbps • Signal Quality Preset Selection - P0, P7 and P8 for L0 and All Presets from P0 to P10 for Lane0 • Link Width - 8 Lanes (Selected test lane: L0,L03,L07) • Automated DUT Control - unchecked • Signal Validation - Pattern Decoding
Compliance_CEM_SYB_x16	<ul style="list-style-type: none"> • Specification - CEM • Device Type - Add-In-Card • Version - Gen3 - 3.0 • Data Rates - 2.5 Gbps, 5 Gbps (Tx equalization 3.5dB, 6 dB) and 8 Gbps • Signal Quality Preset Selection - P0, P7 and P8 for L0 and All Presets from P0 to P10 for Lane0 • Link Width - 16 Lanes (Selected test lane: L0,L07,L15) • Automated DUT Control - unchecked • Signal Validation - Pattern Decoding

Table continued...

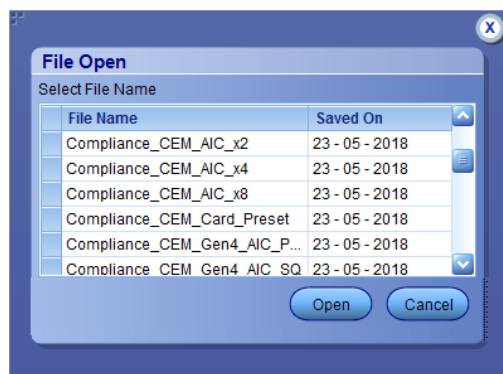
Setup files (*.TekX)	Configuration details (exclusively used in Gen1/2/3 Gold Suite of PCI-SIG Work Shop (WS))
Compliance_U2_Module_x1	<ul style="list-style-type: none"> • Specification - U.2 (SFF8639) • Device Type - Module • Version - Gen3 - 3.0 • Data Rates - 8 Gbps • Signal Quality Preset Selection - P0, P7 and P8 for L0 and All Presets from P0 to P10 for Lane0 • Link Width - 1 Lane (Selected test lane: L0) • Automated DUT Control - unchecked • Signal Validation - Pattern Decoding
Compliance_U2_Module_x2	<ul style="list-style-type: none"> • Specification - U.2 (SFF8639) • Device Type - Module • Version - Gen3 - 3.0 • Data Rates - 8 Gbps • Signal Quality Preset Selection - P0, P7 and P8 for L0 and All Presets from P0 to P10 for Lane0 • Link Width - 2 Lanes (Selected test lane: L0) • Automated DUT Control - unchecked • Signal Validation - Pattern Decoding
Compliance_U2_Module_x4	<ul style="list-style-type: none"> • Specification - U.2 (SFF8639) • Device Type - Module • Version - Gen3 - 3.0 • Data Rates - 8 Gbps • Signal Quality Preset Selection - P0, P7 and P8 for L0 and All Presets from P0 to P10 for Lane0 • Link Width - 4 Lanes (Selected test lane: L0,L03) • Automated DUT Control - unchecked • Signal Validation - Pattern Decoding
Compliance_U2_Host_x1	<ul style="list-style-type: none"> • Specification - U.2 (SFF8639) • Device Type - Host • Version - Gen3 - 3.0 • Data Rates - 8 Gbps • Signal Quality Preset Selection - P0, P7 and P8 for L0 and All Presets from P0 to P10 for Lane0 • Link Width - 1 Lane (Selected test lane: L0) • Automated DUT Control - unchecked • Signal Validation - Pattern Decoding

Table continued...

Setup files (*.TekX)	Configuration details (exclusively used in Gen1/2/3 Gold Suite of PCI-SIG Work Shop (WS))
Compliance_U2_Host_x2	<ul style="list-style-type: none"> • Specification - U.2 (SFF8639) • Device Type - Host • Version - Gen3 - 3.0 • Data Rates - 8 Gbps • Signal Quality Preset Selection - P0, P7 and P8 for L0 and All Presets from P0 to P10 for Lane0 • Link Width - 2 Lanes (Selected test lane: L0) • Automated DUT Control - unchecked • Signal Validation - Pattern Decoding
Compliance_U2_Host_x4	<ul style="list-style-type: none"> • Specification - U.2 (SFF8639) • Device Type - Host • Version - Gen3 - 3.0 • Data Rates - 8 Gbps • Signal Quality Preset Selection - P0, P7 and P8 for L0 and All Presets from P0 to P10 for Lane0 • Link Width - 4 Lanes (Selected test lane: L0, L03) • Automated DUT Control - unchecked • Signal Validation - Pattern Decoding

How to open a setup file

1. Click **Options > Open Test Setup**
2. Select the TekExpress Setup File as per your required configuration. Check Setup files configuration details table for configuration details.



3. Make the configuration details and start the test execution.
4. Click **Save Test Setup As** and save the setup.



Note: You cannot edit the TekExpress Test Setup files as they are in **Read Only** mode.



Note: The setup files path is *C:\Program Files\Tektronix\TekExpress\TekExpress PCI Express\Setup Files*

RF Switch configuration files

TekExpress PCI Express package contains RF Switch configuration files.

File name	Configuration details
PCE_Keithley_SYB_x6	<p>Recall this file for Keithley S46T RF Switch and System-Board device type. The below are the configuration details:</p> <ul style="list-style-type: none"> • Lane0 Positive to Lane05 Positive connected as Signal Inputs to Relay S1. • Lane0 Negative to Lane05 Negative connected as Signal Inputs to Relay S3. • Common output of relay A, B is connected to CH1, CH3 of the oscilloscope respectively. For 2-Unit, SX box ≥ 59 GHz, set the common outputs to CH1, CH3 respectively. • Connect the Ref Clock Positive and Negative from CLB to CH3, CH4 of oscilloscope. For 2-Unit, SX box ≥ 59GHz, set the Ref Clock Positive and Negative to CH2 and CH4 respectively.
PCE_KthCCD_SYB_x12	<p>Recall this file for Keithley S46T RF Switch and System-Board device type. The below are the configuration details:</p> <ul style="list-style-type: none"> • Lane0 Positive to Lane05 Positive connected as Signal Inputs to Relay A which is Cascade to Relay 4 and Input to NO. • Lane0 Negative to Lane05 Negative connected as Signal Inputs to Relay B which is Cascade to Relay 5 and Input to NO. • Lane06 Positive to Lane11 Positive connected as Signal Inputs to Relay C which is Cascade to Relay 4 and Input to NC. • Lane06 Negative to Lane11 Negative connected as Signal Inputs to Relay D which is Cascade to Relay 5 and Input to NC. • Relay 4 is selected as Positive and Relay 5 as Negative; common output of 4 and 5 is connected to CH1, CH2 of the oscilloscope respectively. For 2-Unit, SX box ≥ 59 GHz, set the common outputs to CH1, CH3 respectively. • Connect the Ref Clock Positive and Negative from CLB to CH3, CH4 of oscilloscope. For 2-Unit, SX box ≥ 59GHz, set the Ref Clock Positive and Negative to CH2 and CH4 respectively.
PCE_Giga_SYB_x8	<p>Recall this file for Gigatronics ASCOR 8000 Series RF Switch and System-Board device type. The below are the configuration details:</p> <ul style="list-style-type: none"> • Lane0 Positive to Lane07 Positive connected as Signal Inputs to Relay S1. • Lane0 Negative to Lane07 Negative connected as Signal Inputs to Relay S3. • Common output of relay S1, S3 is connected to CH1, CH3 of the oscilloscope respectively. For 2-Unit, SX box ≥ 59 GHz, set the common outputs to CH1, CH3 respectively. • Connect the Ref Clock Positive and Negative from CLB to CH3, CH4 of oscilloscope. For 2-Unit, SX box ≥ 59GHz, set the Ref Clock Positive and Negative to CH2 and CH4 respectively.
Table continued...	

File name	Configuration details
PCE_GigCCD_SYB_x16	<p>Recall this file for Gigatronics ASCOR 8000 Series RF Switch and System-Board device type. The below are the configuration details:</p> <ul style="list-style-type: none"> • Lane0 Positive to Lane07 Positive connected as Signal Inputs to Relay S1 which is Cascade to Relay S2 and Input to NO. • Lane0 Negative to Lane07 Negative connected as Signal Inputs to Relay S3 which is Cascade to Relay S5 and Input to NO. • Lane08 Positive to Lane15 Positive connected as Signal Inputs to Relay S4 which is Cascade to Relay S2 and Input to NC. • Lane08 Negative to Lane15 Negative connected as Signal Inputs to Relay S6 which is Cascade to Relay S5 and Input to NC. • Relay S2 is selected as Positive and Relay S5 as Negative; common output of S2 and S5 is connected to CH1, CH2 of the oscilloscope respectively. For 2-Unit, SX box \geq 59 GHz, set the common outputs to CH1, CH3 respectively. • Connect the Ref Clock Positive and Negative from CLB to CH3, CH4 of oscilloscope. For 2-Unit, SX box \geq 59GHz, set the Ref Clock Positive and Negative to CH2 and CH4 respectively.
PCE_Keithley_AIC_x12	<p>Recall this file for Keithley S46T RF Switch and Add-In-Card device type. The below are the configuration details:</p> <ul style="list-style-type: none"> • Lane0 Positive to Lane05 Positive connected as Signal Inputs to Relay A. • Lane0 Negative to Lane05 Negative connected as Signal Inputs to Relay B. • Lane08 Positive to Lane11 Positive connected as Signal Inputs to Relay C. • Lane08 Negative to Lane11 Negative connected as Signal Inputs to Relay D. • Common output of relay A, B, C, D is connected to CH1, CH2, CH3, CH4 of the oscilloscope respectively. For 2-Unit, SX box \geq 59 GHz, set the common outputs to CH1, CH3, CH2 and CH4 respectively.
PCE_Giga_AIC_x16	<p>Recall this file for Gigatronics ASCOR 8000 Series RF Switch and Add-In-Card device type. The below are the configuration details:</p> <ul style="list-style-type: none"> • Lane0 Positive to Lane07 Positive connected as Signal Inputs to Relay S1. • Lane0 Negative to Lane07 Negative connected as Signal Inputs to Relay S3. • Lane08 Positive to Lane15 Positive connected as Signal Inputs to Relay S4. • Lane08 Negative to Lane15 Negative connected as Signal Inputs to Relay S6. • Common output of relay S1, S2, S3, S4 is connected to CH1, CH2, CH3, CH4 of the oscilloscope respectively. For 2-Unit, SX box \geq 59 GHz, set the common outputs to CH1, CH3, CH2 and CH4 respectively.

How to run Base SRIS Tx Test Board tests

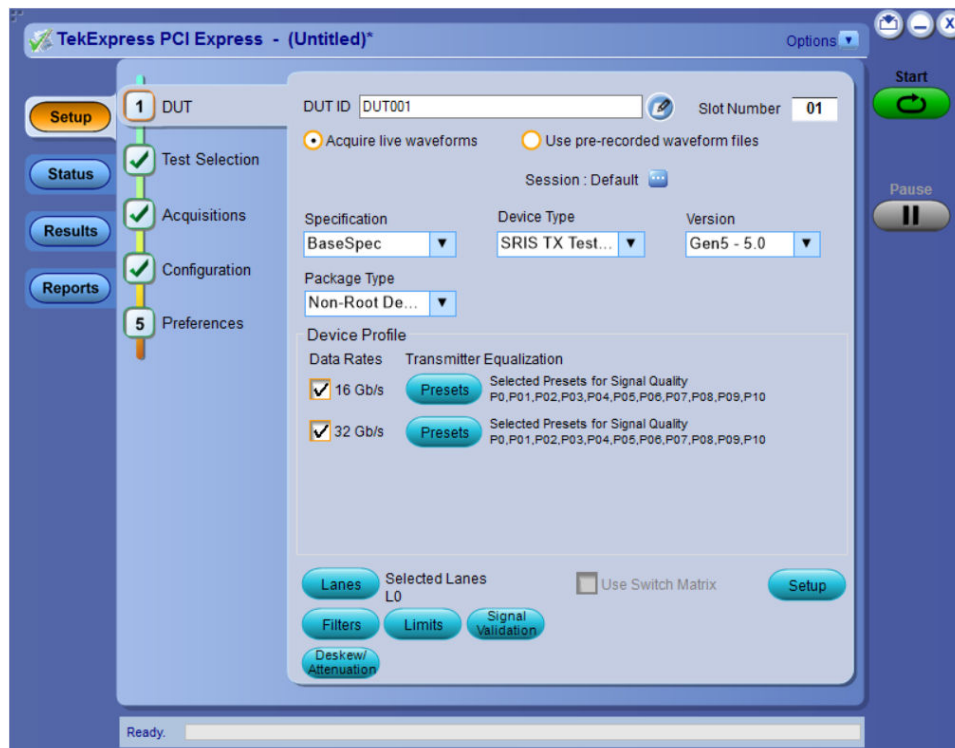
This document describes the procedure to run PCIe Base Spec Gen4/Gen5 SRIS Tx Test Board tests using TekExpress PCI Express.

Accessories required

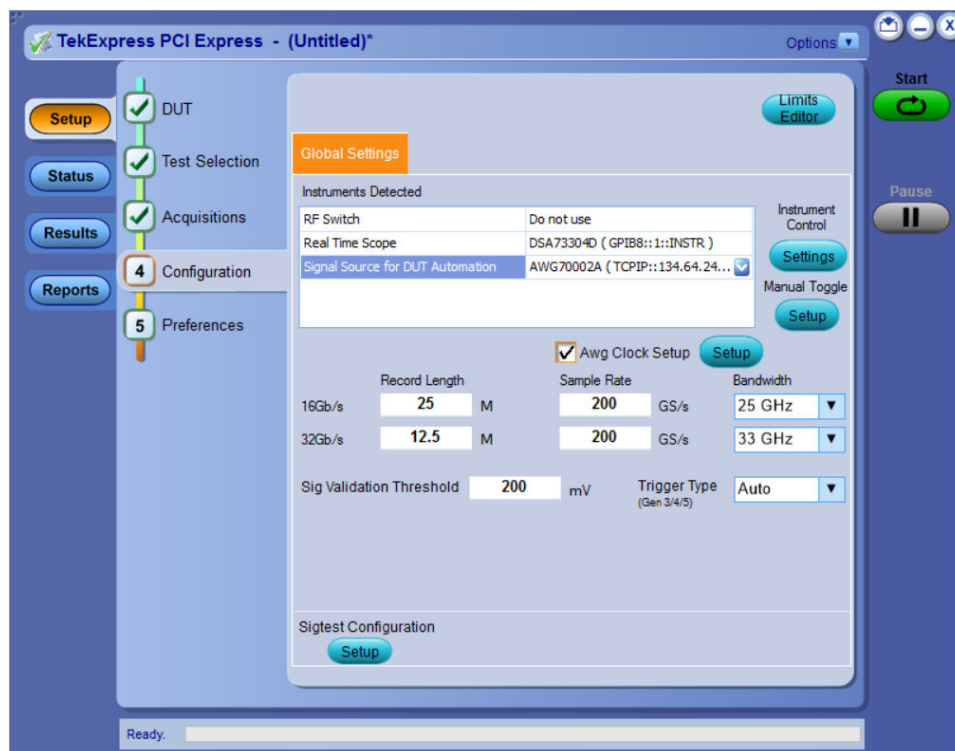
- Gen4/Gen5 Base specification fixture
- SMA-SMP cables
- TCA-SMA 292D / TriMode probes
- AWG7002A or AWG7001A

Capture data signals at sampling rate of 100Gbps/200Gbps with 12.5 M record length. Ensure the PCIE_TX_Toggle_Patterns_v10.0.0.2.exe is installed on AWG-70K series and the recommended probes and real time oscilloscopes are used.

1. In DUT panel, select Specification as BaseSpec and Device Type as SRIS Tx Test Board.



2. If AWG70K is detected then the AWG Clock Setup check box will be enabled in the configuration panel. Click the **Setup** button next to AWG Clock Setup check box. This will bring up the SRIS configuration, with a selection to choose SSC on/Off.



3. Based on the selections of the AWG Clock Setup check box, SSC on/Off selection and different combinations of AWG setup files will be loaded on the AWG. These combinations dictate if an external 100 MHz reference clock (with SSC on/Off) on Ch1 of the AWG will be transmitted. The following AWG files loaded as per configuration for Base specification (Device) and DUT Type SRIS Tx Test Board (Suite) for Gen4 and Gen5.

In Application If user selects the following: Base Specification, SRIS-Tx Test Board DUT Type and Version Gen4 AND in Configure Panel the following selected:					
Sl No	Signal Source for DUT Automation	Automated DUT Control Check Box	AWG Clock Setup Check Box	File loaded from AWG-70000	Recommended Scenario
1	AWG70001A	Selected	Selected with SSC Off	PCIE_Toggle_Sequence_SRIS_avgx	Yes
2	AWG70001A	Selected	Selected with SSC On	PCIE_Toggle_Sequence_SRIS_With_SSC_avgx	No
3	AWG70001A	Not Selected	Selected with SSC Off	PCIE_SRIS_Clock_Without_SSC_avgx	Yes
4	AWG70001A	Not Selected	Selected with SSC On	PCIE_SRIS_Clock_With_SSC_avgx	Yes
5	AWG70001A	Selected	Not Selected	PCIE_Toggle_Sequence_avgx	Yes
6	AWG70002A	Selected	Selected with SSC Off	PCIE_Toggle_Sequence_SRIS_avgx	Yes
7	AWG70002A	Selected	Selected with SSC On	PCIE_Toggle_Sequence_SRIS_With_SSC_avgx	Yes
8	AWG70002A	Not Selected	Selected with SSC Off	PCIE_SRIS_Clock_Without_SSC_avgx	Yes
9	AWG70002A	Not Selected	Selected with SSC On	PCIE_SRIS_Clock_With_SSC_avgx	Yes
10	AWG70002A	Selected	Not Selected	PCIE_Toggle_Sequence_avgx	Yes

4. Click **Start** and when the application prompts, power on the Gen4/Gen5 DUT. Ensure that the DUT transmits Gen4/Gen5 selected presets. Analysis will be done with SigTest.

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