Tektronix®

TekExpress
USB4™ Automated Test Solution Software

Printable Application Help

077-1702-00

TekExpress
USB4™ Automated Test Solution Software

Printable Application Help

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077-1702-00

Tektronix, Inc.

14150 SW Karl Braun Drive

P.O. Box 500

Beaverton, OR 97077

USA

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

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

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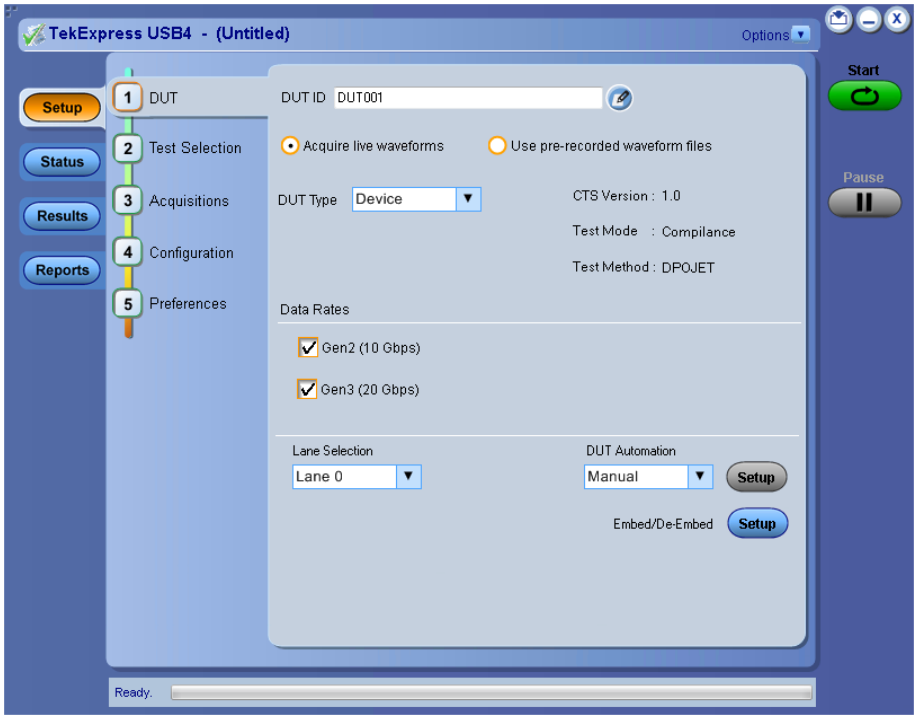
Welcome



Welcome to the TekExpress® USB4 Automated Test Solution Software application (referred to as USB4 in the rest of the document). TekExpress USB4 provides an automated, simple, and efficient way to test USB4 transmitter interfaces and devices for USB-IF compliance through DPOJET for better margin, debugging, and analysis.

Key features and benefits

- Automated solution for USB4 connectors which support USB4 specification and CTS (Gen2 & Gen3).
- DPOJET plugin for connectors which support USB4 specification and CTS (Gen2 & Gen3) with setup files and MOI.
- Support embedding Channels (2 m and 0.8 m) and their respective filter files for connectors.
- Manual support for compliance to debug with DPOJET USB4 and CIO plug-ins.

Contacting Tektronix

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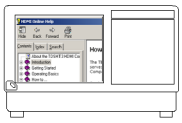
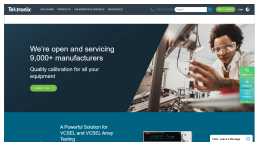
TekExpress USB4 Application Help, 076-0463-00.

Getting help and support

Related documentation

The following manuals are available as part of the TekExpress USB4 Automated Test and Compliance Solution documentation set.

Table 1: Product documentation

Item	Purpose	Location
Help	Application operation and User Interface help	
PDF of the help	Printable version of the compiled help	 PDF file that ships with USB4 software distribution (*USB4-Automated-Test-Solution-Software-Printable-Help-EN-US.pdf*). You can download the PDF version of the manual from the Tektronix website.
USB4 DPOJET MOI.	Detailed information on test setup and execution	PDF file that ships with USB4 software distribution.

See also

Technical support

Conventions used in help

Online help uses the following conventions:

- 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.

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 for more 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
- 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.
- If possible, save the waveform on which you are performing the measurement as a .wfm file.

Getting started

Minimum system requirements

The following table shows the minimum system requirements needed for an oscilloscope to run TekExpress USB4.

Table 2: TekExpress USB4 system requirements

Component	Requirement
Oscilloscope	See *Supported instruments*
Processor	Same as the oscilloscope
Operating System	Same as the oscilloscope: • Windows 10 (64-bit only) SP1 *Windows 10 user account settings*
Memory	Same as the oscilloscope
Hard Disk	Same as the oscilloscope
Display	Super VGA resolution or higher video adapter (800 x 600 minimum video resolution for small fonts or 1024 x 768 minimum video resolution for large fonts). The application is best viewed at 96 dpi display settings [1]
Firmware	TekScope 10.11.1 and above (for Windows 10)
Software	• Microsoft .NET 4.0 Framework • DPOJET Jitter and Eye Analysis Tool (version 10.2.0 or higher) with Advanced Jitter and Eye analysis (DJA option) installed. • Microsoft Internet Explorer 7.0 SP1 or later, or other Web browser for viewing reports. • Adobe Reader software 7.0 or later for viewing portable document format (PDF) files. • Serial Data Link Analysis (SDLA) software, version 3.0.9 or later, for Channel De-Embed, for custom filter development.

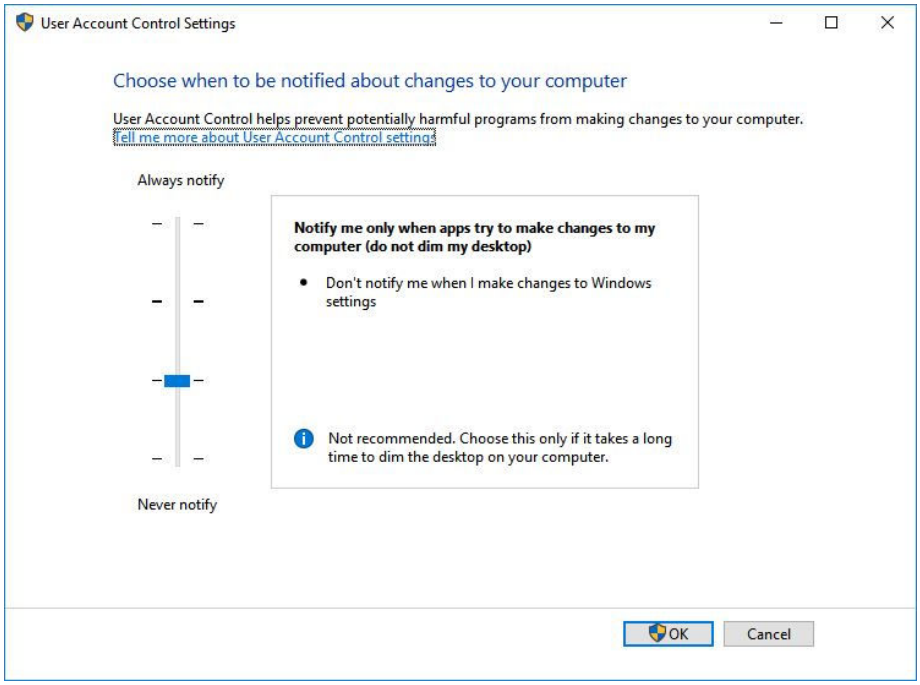
Required windows 10 user account setting

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 **Never Notify** as shown in the image, and click **OK**.

   Windows 10

[1] If TekExpress is running on an instrument that has a video resolution less than 800x600, connect and configure a second monitor to the instrument.



See also

Supported oscilloscopes

Supported instruments

Table 3: Required equipment

Resource	Model supported	
Real-time oscilloscope	Tektronix DPO, DX, and SX series oscilloscopes (Windows 10 OS): • 21 GHz bandwidth is suitable for Gen2 (10 Gbps) and Gen3 (20 Gbps) measurements.	
Probes	Two TCA-SMA cables Two SMP-SMA cables	
USB4 fixtures	• USB-IF approved Wilder-Tech fixtures for USB4 compliance testing. • The fixture set includes Tx Host and Device testing.	
Connector Type	Type C	Symmetrical connector on both side

See also

Minimum system requirements

Install the software

Use the following steps to obtain the latest USB4 software from the Tektronix Web site and install 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 locate the **Downloads** fields.
3. Enter **tekexpress USB4** in the *Model or Keyword* field, select **Software** from the *Select Download Type* list, and click **GO**.
4. Select the latest version of software, and then follow instructions to download the software file.
5. Copy or download the USB4 installer executable file to the oscilloscope.
6. Double-click the installer .exe file to extract the installation files and launch the InstallShield Wizard.

   Follow the on-screen instructions. The software is installed at `C:\Program Files\Tektronix\TekExpress\TekExpress USB4`.
7. *Verify application installation*

See also

Minimum system requirements

Supported instruments

Required My TekExpress folder settings

Verify application installation

To verify the installation was successful:

1. Open the TekScope application.
2. Click the **Analyze** menu.
3. Verify that TekExpress USB4 is listed in the Analyze menu.
4. Click **TekExpress USB4** to open the application.

   Verify that the application opens successfully.

See also

Activate the license

Required My TekExpress folder settings

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.

See also

View version and license information

Required My TekExpress folder settings

View software version

To view version information for TekExpress USB4, click the **Options** button and select **About TekExpress**.

To view license and option key information in the TekScope applicaion:

1. In the TekScope application, select **Help > About TekScope**.
2. Scroll through the Options list to locate USB4: TekExpress USB4 .

3. To view the Option installation key value, look below the Options list.

See also

Activate the license

Options menu

Required my TekExpress folder settings

Before you run tests for the first time, you need to *Set the My TekExpress folder permissions*.

See also

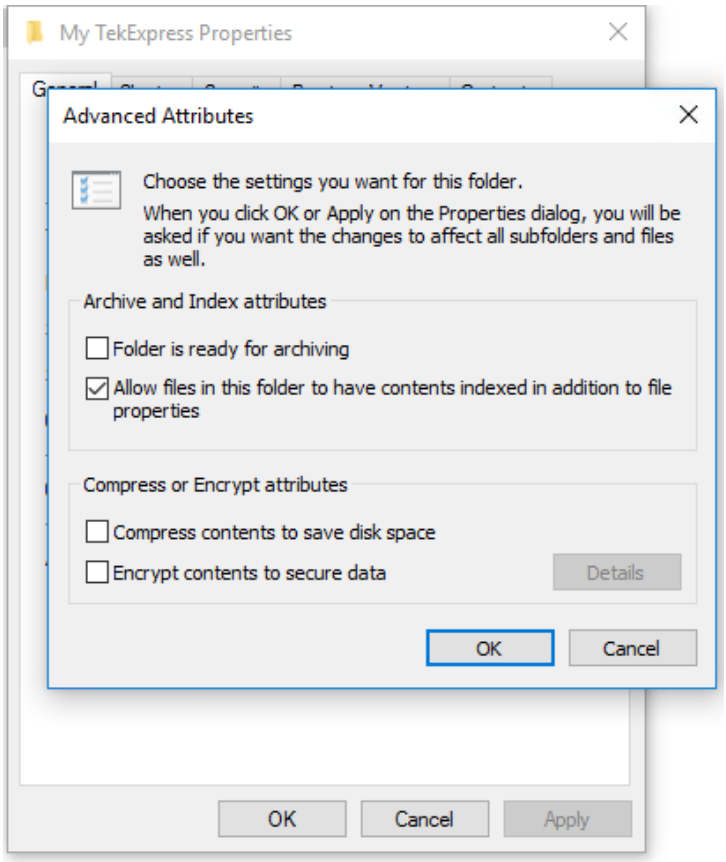
Application directories and usage

File name extensions

Set my TekExpress folder permissions

Ensure that the My TekExpress folder has read and write access. Also verify that the folder is not set to be encrypted:

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



4. Click the **Security** tab and verify that the correct read and write permissions are set.

See also

Application directories and usage

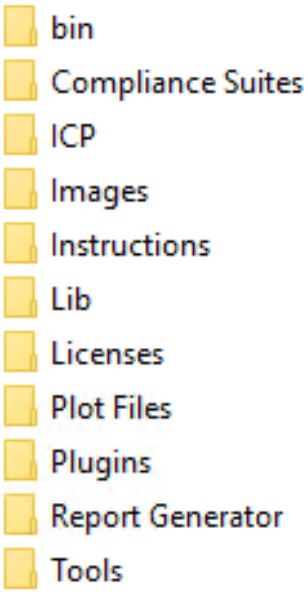
File name extensions

Application directories and their contents

TekExpress USB4application

The TekExpress USB4 application files are installed at the following location:

`C:\Program Files\Tektronix\TekExpress\TekExpress USB4`



The following table lists the application directory names and their purpose.

Table 4: Application directories and usage

Directory names	Usage
Bin	It contains USB4 application libraries.
Compliance Suites	It contains compliance-specific files.
Examples	It contains various support files.
ICP	It contains instrument and USB4 application-specific interface libraries.
Lib	It contains utility files specific to the USB4 application.
Report Generator	It contains style sheets for report generation.
Setup Files	It contains setup files.

Table continued…

Directory names	Usage
Tools	It contains instrument and USB4 application-specific files.

See also

View test-related files

File name extensions

File name extensions

The TekExpress USB4 Tx application uses the following file name extensions:

File name extension	Description
.TekX	Application session files (the extensions may not be displayed)
.xml	Test-specific configuration information (encrypted) files Application log files
.wfm	Test waveform files
.mht	Test result reports (default) Test reports can also be saved in pdf format or in CSV format
.flt	Filter files
.xslt	Style sheet used to generate reports
.pdf, .chm	Help files

See also

View test-related files

Application directories and their contents

Where test files are stored

When you launch TekExpress USB4 for the first time, it creates the following folders on the oscilloscope:

- `\My Documents\My TekExpress\USB4`
- `\My Documents\My TekExpress\USB4\Untitled Session`

Every time you launch TekExpress USB4, an `Untitled Session` folder is created in the `USB4` folder. The `Untitled Session` folder is automatically deleted when you exit the `USB4` 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, the application creates a .TekX file, and a folder named for the session that contains associated files, on the oscilloscope X: drive.

See also

Set the My TekExpress folder permissions

Application directories and usage

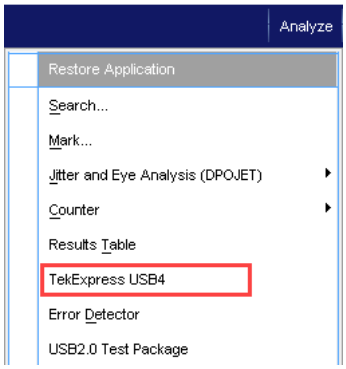
File name extensions

Operating basics

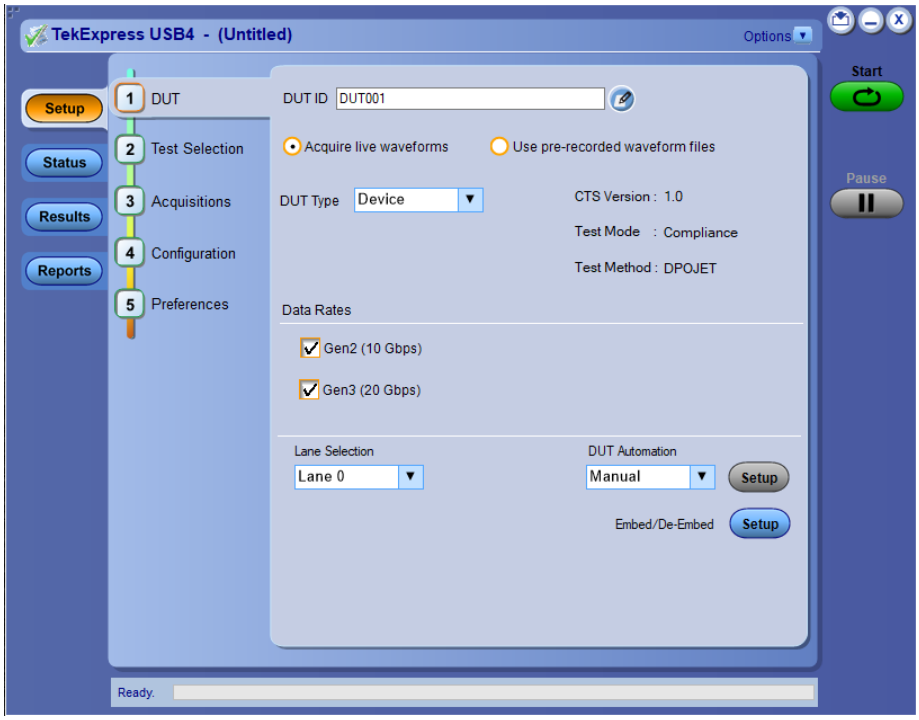
Run the application

To start the TekExpress USB4 application, do either of the following:

- Select **Analyze > TekExpress USB4** from the TekScope menu.



- The oscilloscope opens the TekExpress USB4 application.



When you first run the application after installation, the application checks for a file called `Resources.xml` located in the `C:\Users\<username>\My TekExpress\USB4` folder. The Resources.xml file gets mapped to the `X:` drive when the application launches. Session files are then stored inside the `X:\USB4` folder. The Resources.xml file contains information about available network-connected instruments. If this file is not found, the application runs an instrument discovery program to detect connected instruments before launching USB4.

Note: Do the steps in the *Required My TekExpress folder settings* topic before running tests with the USB4 application for the first time.

To keep the USB4 application window on top, select **Keep On Top** from the USB4 *Options menu*. If the application goes behind the oscilloscope application, click **Analyze > TekExpress USB4** to move the application to be in front.

See also

Required My TekExpress folder settings

Activate the license

Application controls

Application panel overview

Application panels overview

TekExpress USB4 uses panels to group related configuration, test, and results settings. Click a button to open the associated panel. A panel may have one or more tabs that list the selections available in that panel. Controls in a panel can change depending on settings made in that panel or another panel.

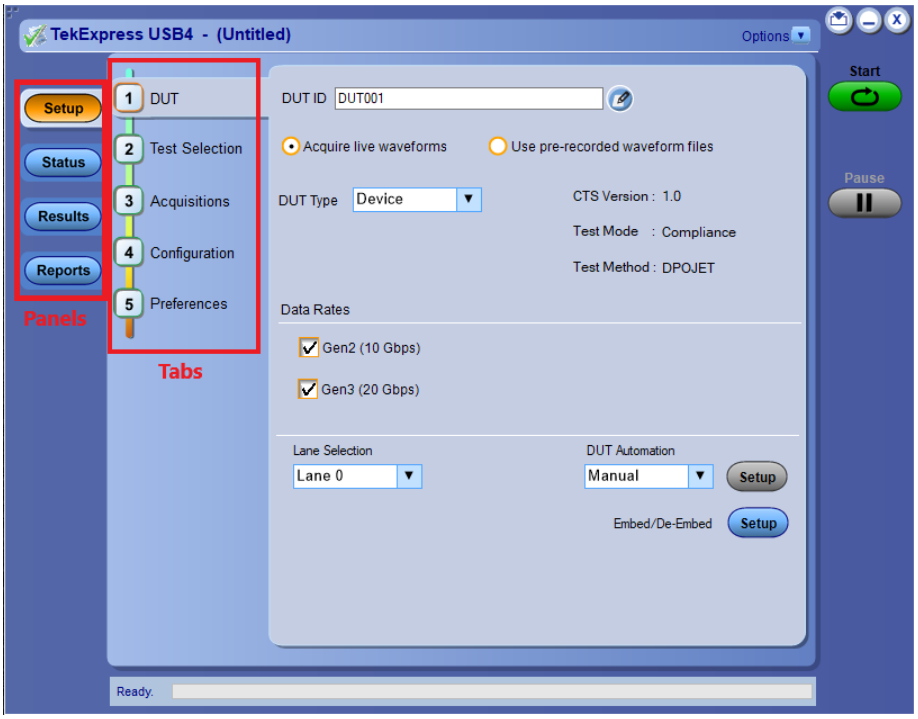


Table 5: Application panels overview

Panel Name	Purpose
Setup	The Setup panel shows the test setup controls. Click the **Setup** button to open this panel. Use this panel to: • *Select DUT parameters*. • *Select the test(s)*. • *Set acquisitions parameters* for selected tests. • *Select test notification preferences*.
Status	View the progress and analysis status of the selected tests, and view test logs.
Results	View a summary of test results and select result viewing preferences.
Reports	Browse for reports, save reports as specific file types, specify report naming conventions, select report content to include (such as summary information, detailed information, user comments, setup configuration, application configuration), and select report viewing options.

See also

Application controls

Global application controls

Application controls

Table 6: Application controls descriptions

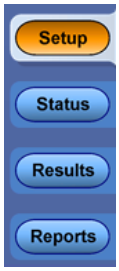
Item	Description
Options menu 	Menu to display global application controls.
Test Panel buttons 	Controls that open panels for configuring test settings and options.

Table continued…

Item	Description
Start / Stop button 	Use the Start button to start the test run of the measurements in the selected order. If prior acquired measurements have not been cleared, the 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 temporarily interrupt the current acquisition. When a test is paused, the button name changes to “Continue.”
Clear button 	Use the Clear button to clear all existing measurement results. Adding or deleting a measurement, or changing a configuration parameter of an existing measurement, also clears measurements. This is to prevent the accumulation of measurement statistics or sets of statistics that are not coherent. This button is available only on the *Results panel*.
Minimize button 	Use the Minimize button to minimize the application.
Quit button 	Use the Quit button to exit the application.
Mini view/ Normal view 	Toggles the application between Mini view and Normal view. Mini view displays the run messages with the time stamp, progress bar, Start/Stop button, and Pause/Continue button. The application moves to Mini view when you click the Start button.

See also

Application panel overview

Options menu overview

The Options menu is located in the upper right corner of the application. The Options menu has the following selections:

Menu	Function
Default Test Setup	Opens an untitled test setup with defaults selected
Open Test Setup	Opens a saved test setup
Save Test Setup	Saves the current test setup selections
Save Test Setup As [2]	Creates a new test setup based on an existing one

Table continued…

[2] In pre-recorded mode, waveform recall will not be successful if the session name is more than 10 characters.

Menu	Function
Open Recent	Displays a menu of recently opened test setups to select from
Instrument Control Settings	Detects, lists, and refreshes the connected instruments found on specified connections (LAN, GPIB, USB)
Keep On Top	Keeps the TekExpress USB4 application on top of other open windows on the desktop
Email Settings	Use to configure email options for test run and results notifications
Deskew	Use to set deskew parameter and read instrument deskew/ attenuation values
Help	Displays the TekExpress USB4 help
About TekExpress	• Displays application details such as software name, version number, and copyright • Provides access to *License information* for your USB4 installation • Provides a link to the Tektronix Web site

See also

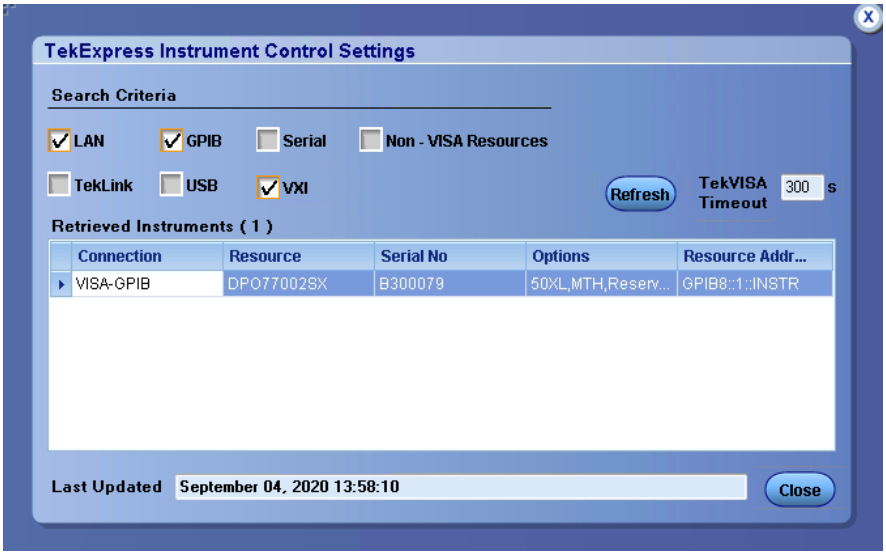
Application controls

TekExpress instrument control settings

Instrument control settings

Use the TekExpress Instrument Control Settings dialog box to search for and list the connected resources (instruments) detected on selected connections (LAN, GPIB, USB), and each instruments connection information.

Access this dialog box from **Options > Instrument Control Settings**.



Use the Instrument Control Settings feature to *search for connected instruments* and view instrument connection details. You can select listed connected instruments for use in the Global Settings tab in the test configuration pane.

See also

Options menu overview

View connected instruments

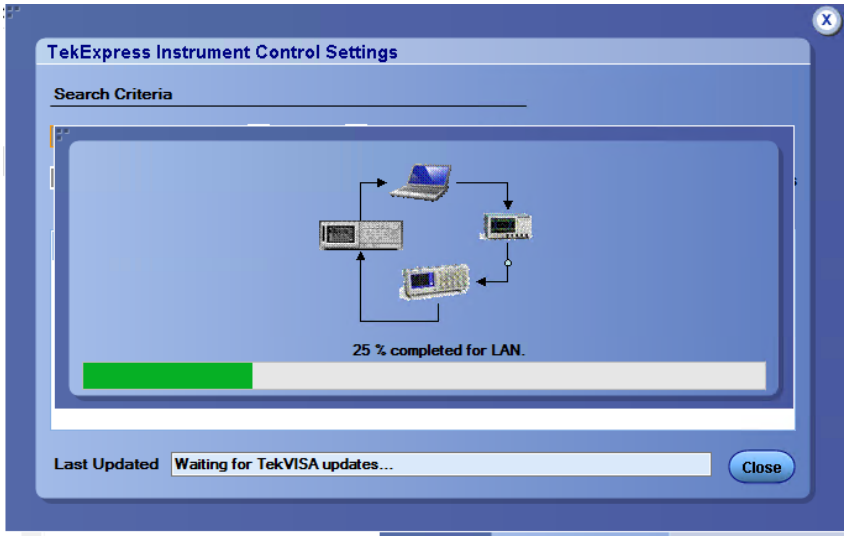
Use the Instrument Control Settings dialog box to view or search for connected instruments required for the tests. The application uses TekVISA to discover the connected instruments on all selected connection types.

Note: The correct instruments for the current test setup must be connected and recognized by USB-TX before running tests.

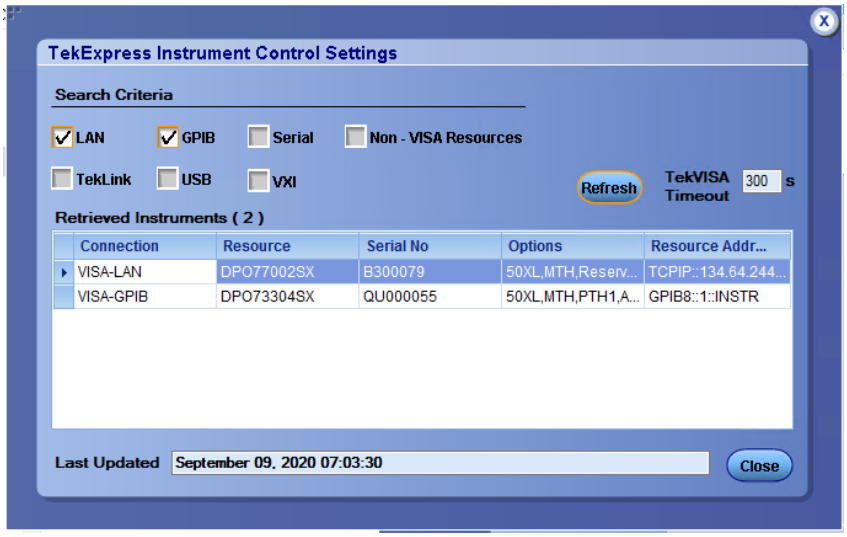
To refresh the list of connected instruments:

1. From the Options menu, select **Instrument Control Settings**.
2. In the **Search Criteria** section of the Instrument Control Settings dialog box, select the connection types of the instruments for which 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 TekExpress that are communicating over the LAN.
3. Click **Refresh**. TekExpress searches for connected instruments.



4. After searching, the dialog box lists the instrument-related details based on the search criteria you selected. For example, if you selected LAN and GPIB as the search criteria, the application checks for the availability of instruments over LAN, then GPIB, and then lists detected instruments on those connection types.



The Retrieved Instruments table lists instrument details. The time and date of the last time this table was updated is displayed in the Last Updated field.

See also

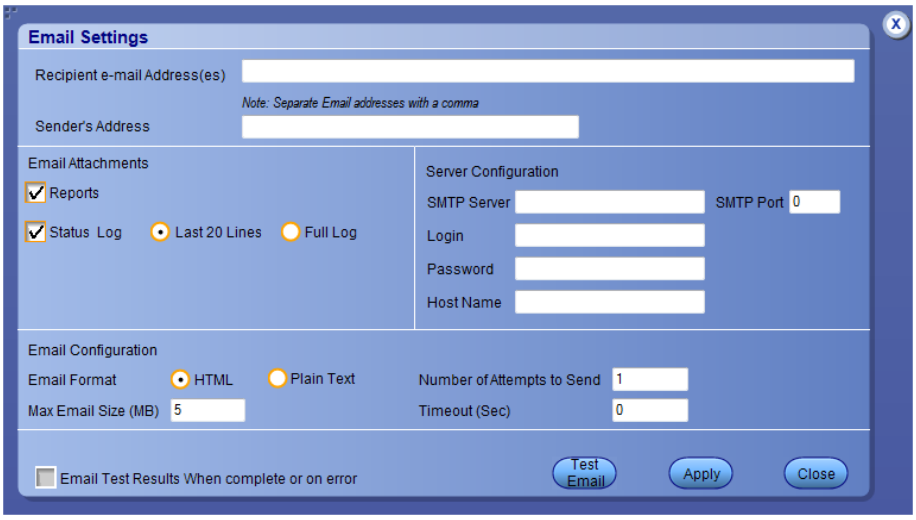
Equipment connection setup

Configure email settings

Use the Email Settings dialog box to be notified by email when a test completes, fails, or produces an error:

1. Select **Options > Email Settings** to open the Email Settings dialog box.

   Email settings



2. (Required) For Recipient email Address(es), enter one or more email addresses to which to send the test notification. To include multiple addresses, separate the addresses with commas.
3. (Required) For Sender's Address, enter the email address used by the instrument. This address consists of the instrument name followed by an underscore followed by the instrument serial number, then the @ symbol and the email server used. For example: DPO72016C_B130099@yourcompany.com.
4. (Required) In the Server Configuration section, type the SMTP Server address of the Mail server configured at the client location, and the SMTP Port number, in the corresponding fields.

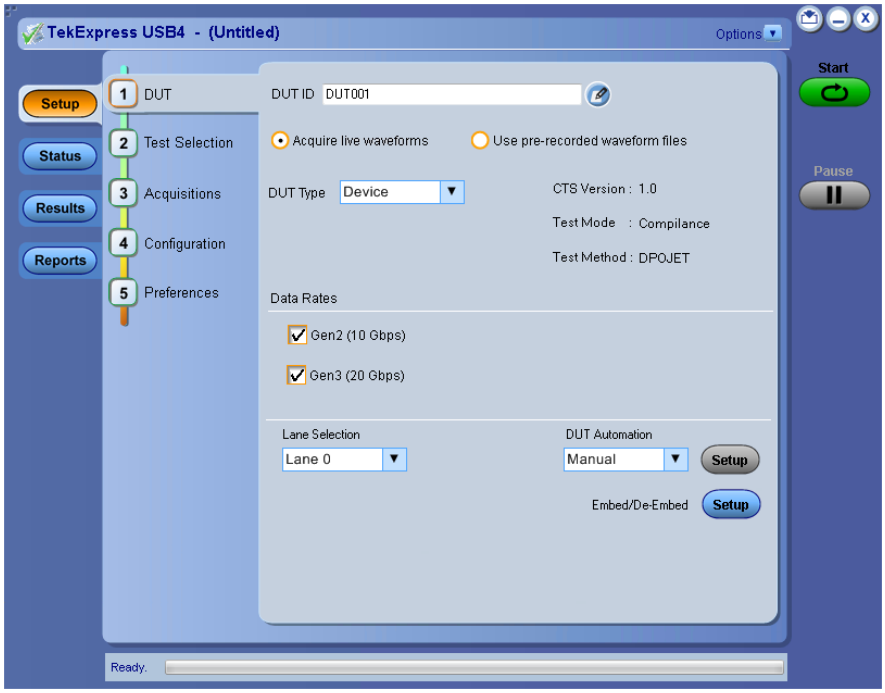
   If this server requires password authentication, enter a valid login name, password, and host name in the corresponding fields.

   Note: If any of the above required fields are left blank, the settings will not be saved and email notifications will not be sent.
5. In the Email Attachments section, select from the following options:
   - **Reports**: Select to receive the test report with the notification email.
   - **Status Log**: Select to receive the test status log with the notification email. If you select this option, select whether you want to receive the full log or just the last 20 lines.
6. In the Email Configuration section:
   - **Email Format**: Select the message file format to send: HTML (the default) or plain text.
   - **Max Email Size (MB)**: Enter a maximum file size for the email message. Messages with attachments larger than this limit will not be sent. The default is 5 MB.
   - **Number of Attempts to Send**: Enter the number 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

Setup panel overview

The Setup panel contains sequentially ordered tabs that help guide you through a typical test setup and execution process. Click a tab to open the associated panel and controls.



The tabs on this panel are:

DUT: *Set the DUT parameters*

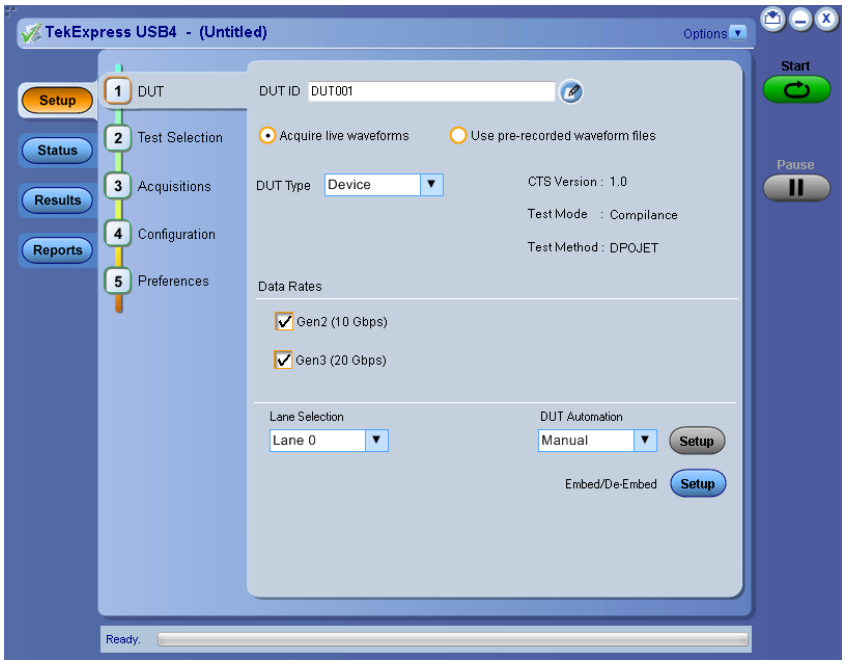
Test Selection: *Select test(s)*

Acquisitions: *Select acquisition parameters*

Preferences: *Select test fail notification preferences*

Set DUT parameters

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



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

Table 7: DUT tab settings

Setting	Description
DUT ID	Adds an optional text label for the DUT to reports. The default value is DUT001. The maximum number of characters is 32. You cannot use the following characters in an ID name: (.,..,...,\,/:?"<>|*).
Comments icon (to the right of the DUT ID field)	Opens a Comments dialog box in which to enter optional text to add to a report. Maximum number of characters is 256. To enable or disable comments appearing on the test report, see *Select report options*).
Help	Opens the help document with DUT page selected.
Acquire live waveforms	Acquire active signals from the DUT for measurement and analysis.
Use prerecorded waveform files	Run tests on a saved waveform. *Open (load) a saved test setup*.
DUT Type	• Device: Select the DUT type as Device. • Host: Select the DUT type as Host.
Version	Displays the CTS version.

Table continued…

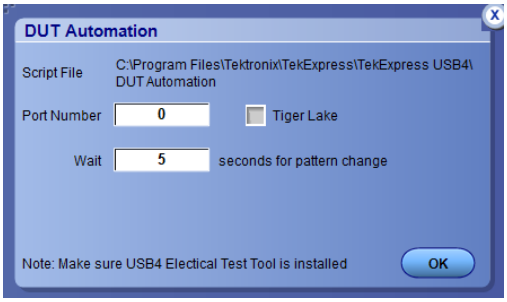
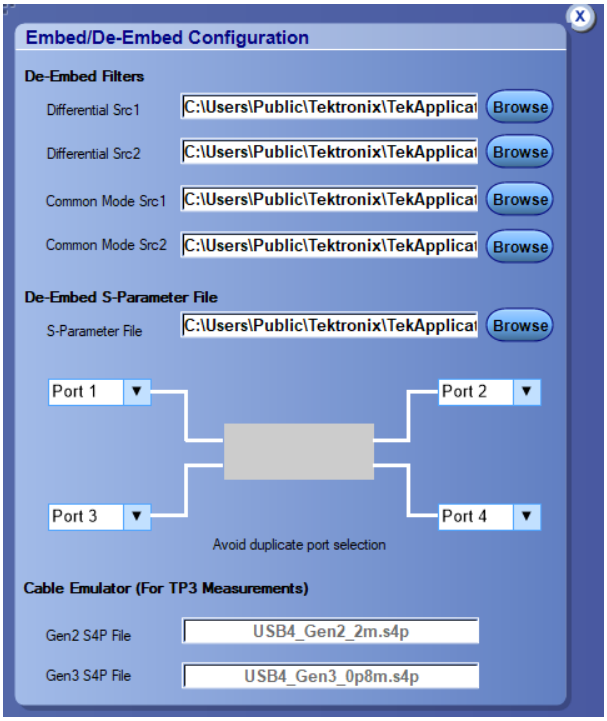
Setting	Description
Test Mode	Displays the selected test mode. Preselects tests and parameters needed to meet compliance specifications for the selected device type. Disables the compliance filter controls.
Test Method	Displays the selected test method. The selected test method, sets the algorithms used to measure and analyze the signal. DPOJET: Select to perform measurements implemented in DPOJET (only for RP1).
Data Rates	Sets the test data rate (10 Gbps or 20 Gbps). • Gen2: Select to include the data rate for Gen2. • Gen3: Select to include the data rate for Gen3.
Lane Selection	Select the Lane Selection as Lane 0 or Lane 1.
DUT Automation	DUT Automation. • Manual • Automated Enables the Setup button.  Click Setup. In the DUT Automation pop-up, select the TGL (Tiger Lake) to setup the DUT automation. Set the DUT Port Number (0 -63) and the waiting time after automated pattern change. Default value for port number is 0 and wait time is 5 seconds.

Table continued…

Setting	Description
Filter Selection	You can change the Differential de-embed filter files, change the common mode deembed filter files. The test mode is fixed to compliance, therefore, cable emulator (for TP3 measurements) files are fixed. The de-embed S parameter file (.s4p) is loaded into the SDLA Equalizer to de-embed the cables connected to the fixture. The 4 port index configuration for the chosen file is displayed. Assign the valid port depending on the loaded .s4p file. The two ports on the left are input ports and the two ports on the right are the output ports.  *Figure 1: Filter Selection*

See also

Select a test

Select tests

Use the **Test Selection** tab to select **USB4** tests. Listed tests depend on settings in the DUT tab.

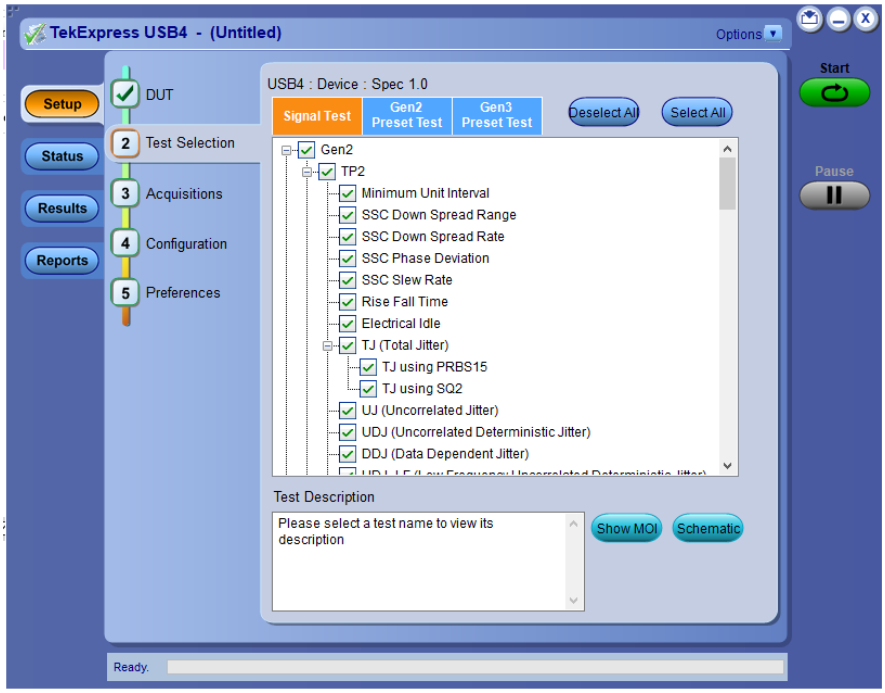


Table 8: Test Selection tab settings

Setting	Description
Deselect All, **Select All**	Deselect or select all tests in the list.
Tests	Click a test to select or deselect. Selecting a test also show details about that test in the Test Description pane. All required tests are selected when in Compliance test mode.
Schematic	Displays equipment connection setup for the selected measurements. You need to select at least a measurement before you click the Schematic.
Show MOI	Displays the MOI (*USB4 DPOJET MOI*)

Note: All tests are selected by default.

Note: The application does not show the oscilloscope cursor1 and 2 for each burst. The application runs an analysis on the first five bursts of an acquisition and displays the result statistics.

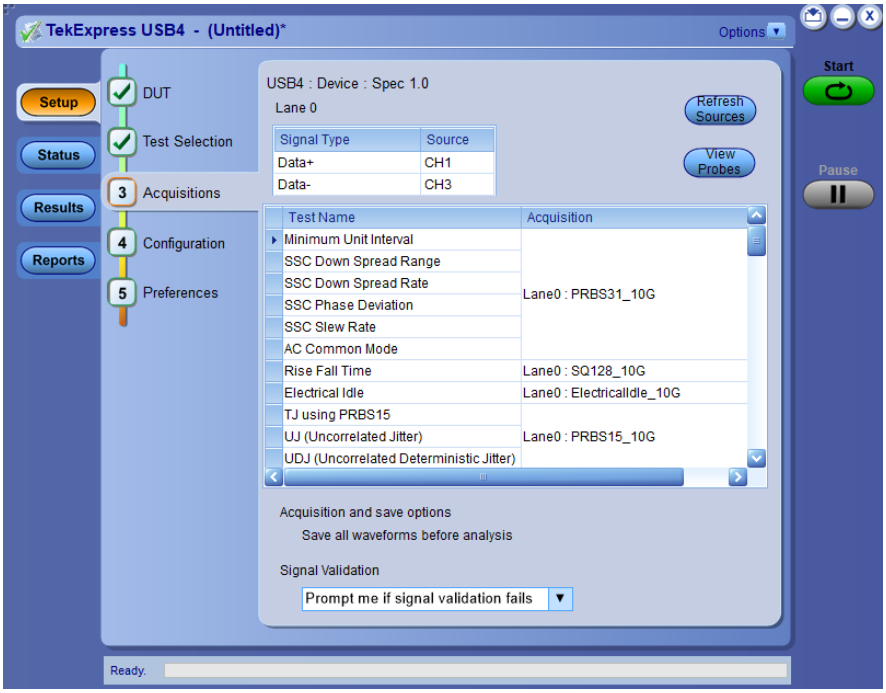
See also

Set acquisition parameters

Set acquisition parameters

Use the **Acquisition** tab in the Setup panel to view test acquisition parameters. You also use this tab to load prerecorded (saved) test session waveform files on which to run tests.

Contents displayed on this tab depend on the DUT type and selected tests.



Note: USB4 acquires all waveforms required by each test group and generation being tested (Gen1, Gen2) before performing analysis.

Table 9: Acquisitions tab settings

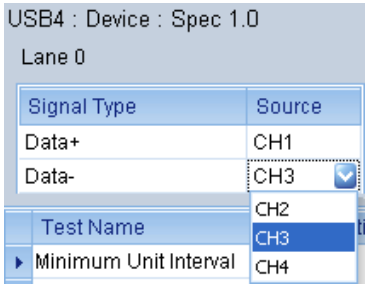
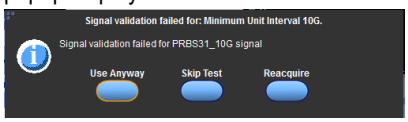
Setting	Description
Source Selection	Lists the signal type and input channel assigned to that type. Click on Source fields to assign a channel source to a signal type.  The (Source) channels are auto selected, based on the probe type used and Lane selected on the DUT tab.
Refresh sources	Updates the list of available channel sources as used by the Source fields in the Device list. Click this button if you change channel connections in the test setup.
View Probes	Displays the Source, Probe Type, and Probe models.
Acquisition and save options	Saves all waveforms before the analysis.

Table continued…

Setting	Description
Signal Validation	Sets the signal validation actions. Select from the available list items. • Prompt me if signal fails • Skip test if signal validation fails • Use signal as is - Don't Check When the signal validation option is set to "Prompt me if signal validation fails", the application validates whether the signal is PRBS31, PRBS15, SQ128, or SQ2 pattern. Additionally, it also validates if the signal is Electrical idle. If the signal is valid, the measurement continues normally. If the signal is invalid, the following popup displays:  **Note:** If Pattern type validation is selected as **No**, then the measurement continues with the acquired waveform. • Click **Reacquire** to start the acquisition again. • Click **Use Current** to continue with the currently acquired waveform. • Click **Skip Pattern** to skip all pattern type tests. The rest of the selected measurements continue.

USB4 saves all acquisition waveforms to files by default. 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:\TekExpress USB4\Untitled Session \<dutid>\<date>_<time>`. Images created for each analysis, reports, and other information specific to that session are also saved in this folder.

When the session is saved, content is moved to that session folder and the “Untitled Session” name is replaced by the session name.

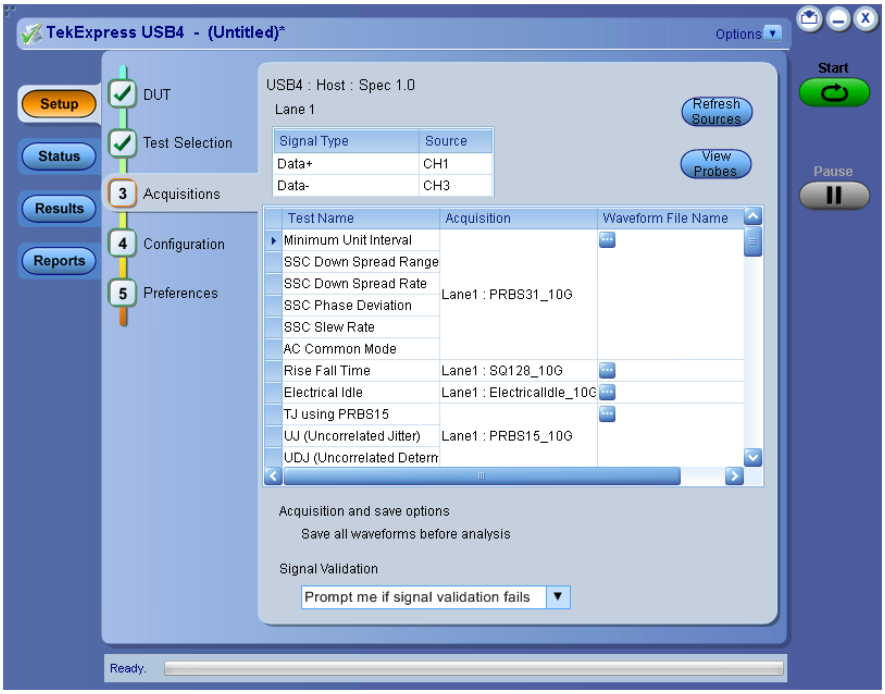
See also

Running tests on prerecorded saved waveforms

Running tests on prerecorded (saved) waveforms

To load a saved waveform file:

1. Click **DUT**.
2. Click **Use pre-recorded waveform files**.
3. Click **Acquisitions**. The Waveform Filename column now shows browse buttons.



4. Click the browse button ( ) for each test acquisition type PRBS15, PRBS31, SQ128, and SQ2.
5. Navigate to and select the appropriate waveform file(s). You must select all waveforms required for the acquisition type.
6. To change, remove, or add a file to the list, click the browse button next to the file name to change, and use the menu items to replace, remove (delete) or add a file in the list.
7. Click **Start**.

Set configuration tab parameters

Use the **Configuration** tab to set and view global instrument parameters for the selected tests. Which fields are available to edit as set in this tab or the DUT tab.

Note: You cannot change test parameters that are grayed out.

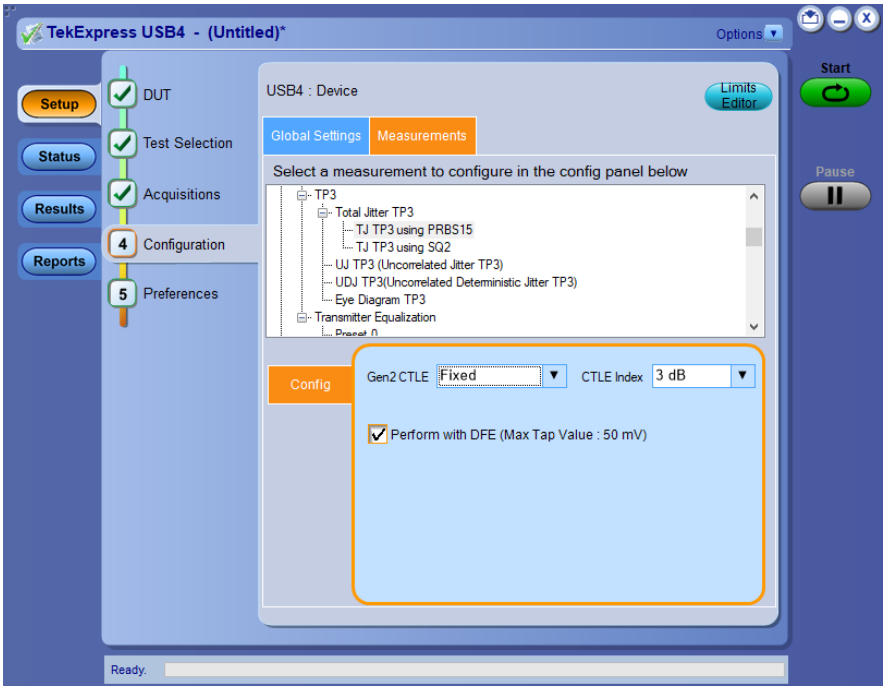


Figure 2: Configuration tab - Measurements

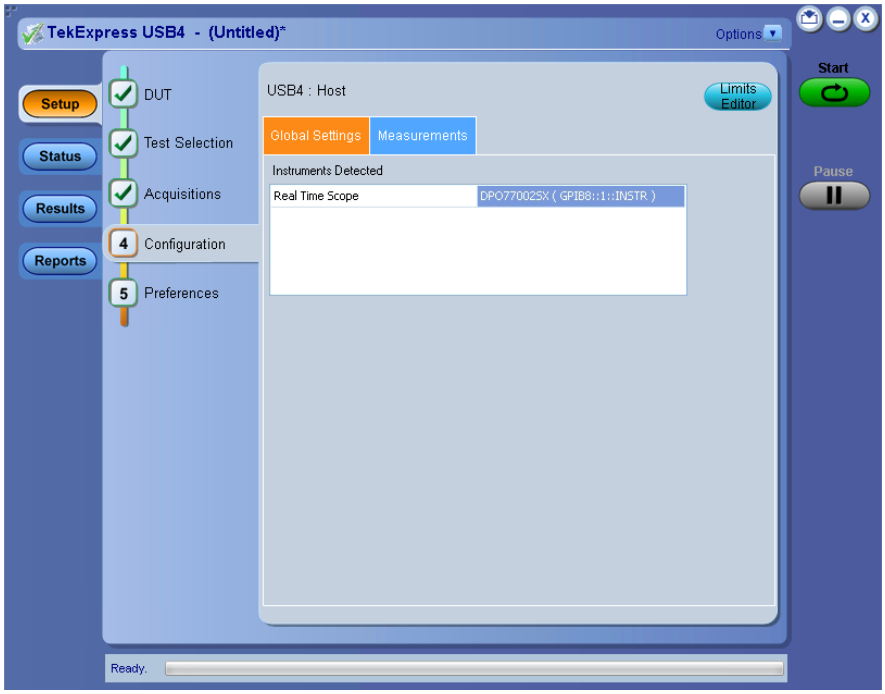


Figure 3: Configuration tab - Global Settings

Table 10: Configuration tab settings

Setting	Description
Limits Editor	Opens the Limits Editor dialog box. In Compliance Mode, use the Limits Editor to view the measurement high and low limits used for selected tests. You cannot edit values while in Compliance mode.
Global Settings	
Instruments Detected	Displays a list of the connected instruments found during the instrument discovery. Instrument types includes oscilloscopes. Select **Options > Instrument Control Settings** to *refresh the connected instrument list*.
Measurements	
Measurements	Displays the list of measurements.
Config Select the configuration for the measurements with TP3.	
Gen2 and Gen3 CTLE	Select the CTLE filter file for Gen2 and Gen3.
CTLE Index	Set the CTLE index value.
Perform with DFE (Max Tap Value: 50 mV)	Select to perform the DFE.

Preferences tab

Use the Preferences tab to set the application action when a test measurement fails.

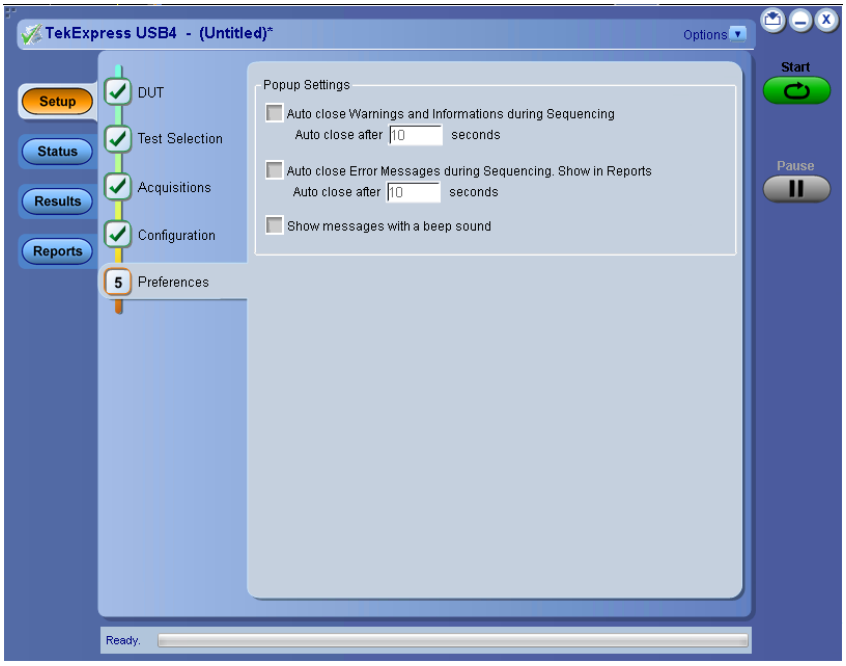


Table 11: Preferences tab settings

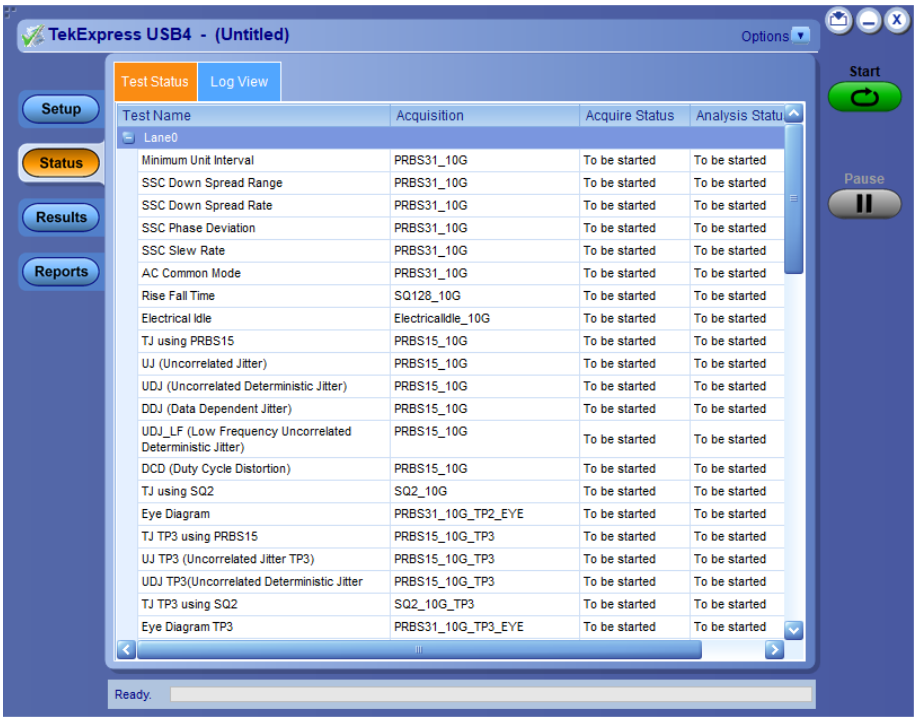
Setting	Description
Popup Settings	
Auto close Warnings and Informations during Sequencing Auto close after <no> Seconds	Select to auto close warnings/informations during sequencing. Set the Auto close time. By default, it is unselected.
Auto close Error Messages during Sequencing. Show in Reports. Auto close after <no> Seconds	Select to auto close Error Messages during Sequencing. Set the Auto close time. By default, it is unselected.
Show messages with a beep sound.	Select to show the messages with a beep sound.

Status panel

Status panel overview

The Status button accesses the Test Status and Log View tabs, which provide status on test acquisition and analysis.(Test Status tab) and a listing of test tasks performed (Log View tab). The application opens the Test Status tab when you start a test run. You can select the Test Status or the Log View tab to view these items while tests are running.

Test status view



Log view

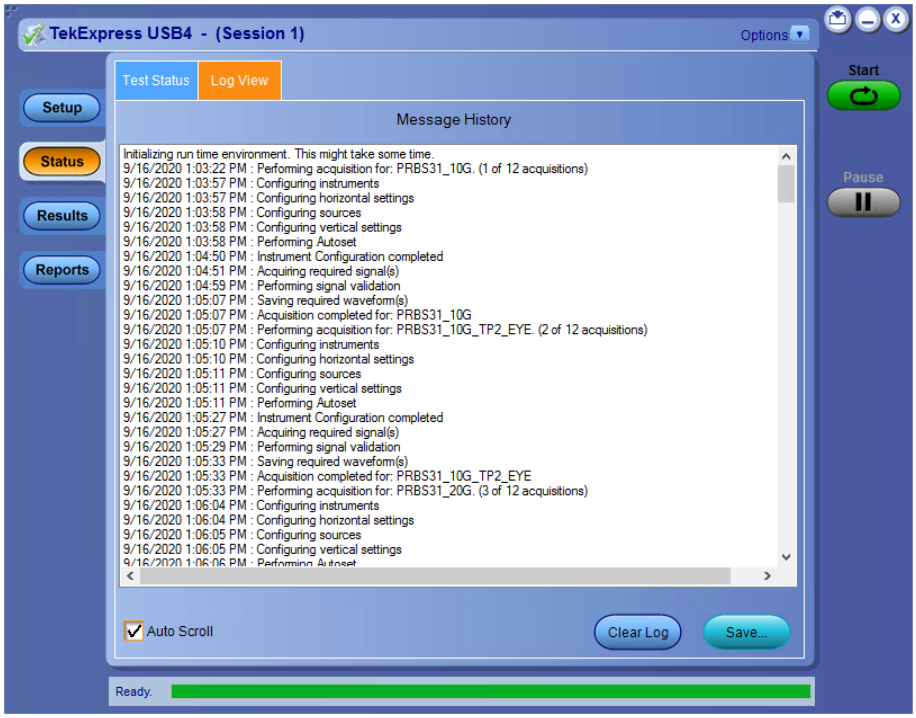


Table 12: Status panel settings

Control	Description
Message History	Window that lists all 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.
Clear Log	Clears all messages from the log view.
Save	Saves the log file to a text file. Use the standard Save File window to navigate to and specify the folder and file name to which to save the log text.

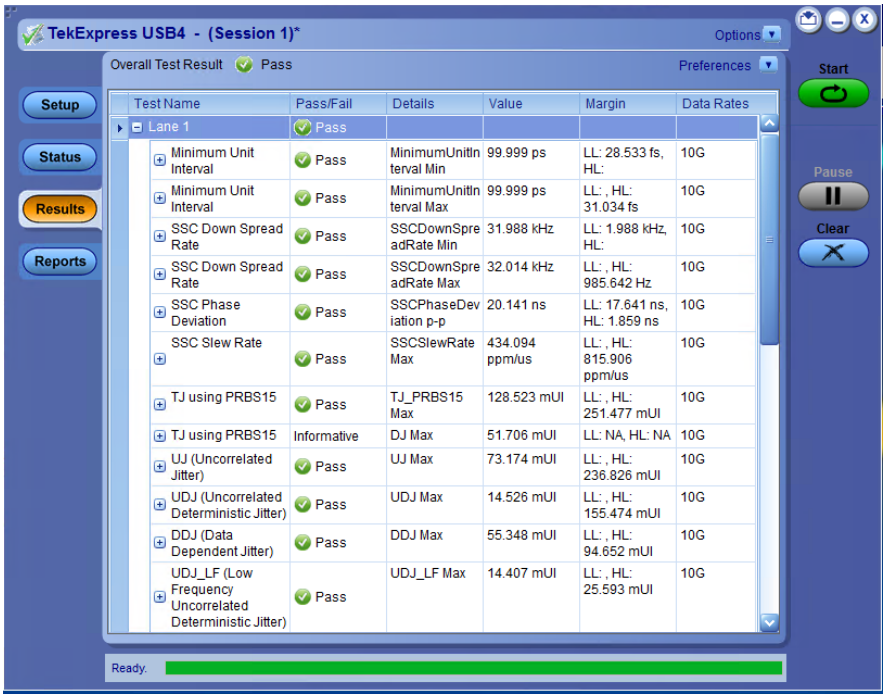
See also

Application panel overview

Results panel

Results panel overview

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



The Overall Test Result is displayed at the top left of the Results table. If all of the tests for the session pass, the overall test result is **Pass**. If one or more tests fail, the overall test result is **Fail**.

Set viewing preferences for this panel from the *Preferences menu* in the upper right corner. Viewing preferences include showing whether a test passed or failed, summary or detailed results, and enabling wordwrap.

Note: NAN (Not A Number) is displayed in the test results if an invalid waveform was supplied for the test.

Each test result occupies a row in the Results table. By default, results are displayed in summary format with the measurement details collapsed and with the Pass/Fail column visible. Change the view in the following ways:

- To expand and collapse tests to show more or less detail, click the plus and minus buttons in the table.
- 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**.
- Use the *Preferences menu* to change how some items display in the Results panel.

See also

View a report

Application panels overview

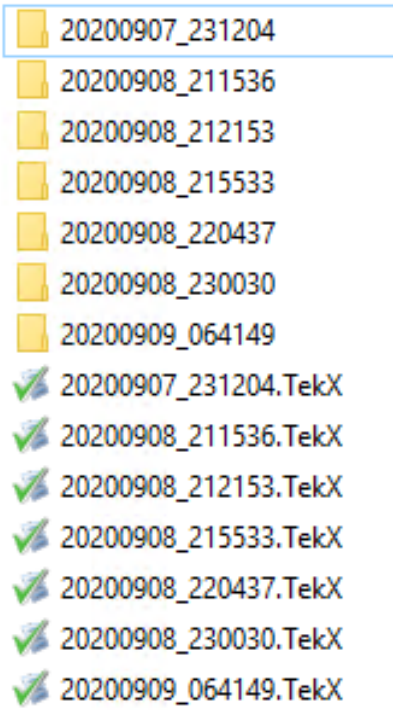
View test-related files

Files related to tests are stored in the `My TekExpress\USB4` folder. Each test setup in this folder has 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 and usually has no visible file name extension.

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 `..\My TekExpress\TekExpress USB4`. 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 USB4 application.

See also

File name extensions

Required My TekExpress folder settings

Preferences menu

The Preferences menu is part of the Results panel display. Use the Preferences menu to change how some items display in the Results panel.

- To show or hide the Pass/Fail column, select **Preferences > Show Pass/Fail**.
- To collapse all expanded tests, select **Preferences > View Results Summary**.
- To expand all tests listed, select **Preferences > View Results Details**.
- To enable or disable the wordwrap feature, select **Preferences > Enable Wordwrap**.

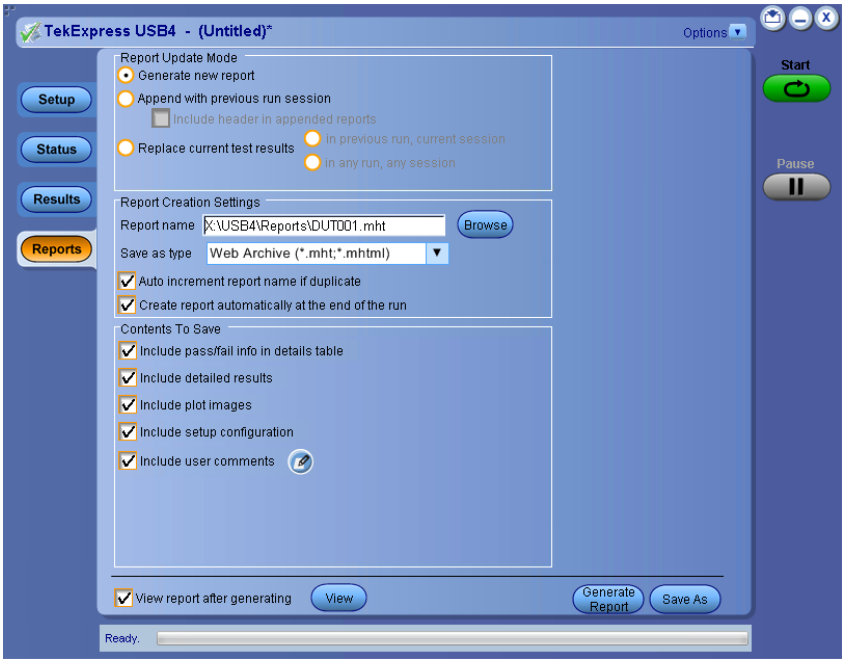
See also

Results panel overview

Reports panel

Reports panel overview

Use the Reports panel to view saved reports, name and save reports from the current session, select test content to include in reports, and select report viewing options.



For information on setting up reports, see *Select report options*. For information on viewing reports, see *View a Report*.

See also

About panels

Select report options

Click the **Reports** button and use the Reports panel controls to select which test result information to include in the report, and the naming conventions to use for the report. For example, always give the report a unique name or select to have the same name increment each time you run a particular test.

Select report options before running a test or when creating and saving test setups. Report settings are included in saved test setups.

In the Reports panel, select from the following report options:

Table 13: Report options

Setting	Description
Report Update Mode	
Generate new report	Creates a new report.

Table continued…

Setting	Description
Append with previous run session	Appends the latest test results to the end of the current session's test results report.
Include header in appended reports	Select to include header in the appended reports.
Replace current test in previous run session	Replaces the previous test results with the latest test results. Results from newly added tests are appended at the end of the report. • In previous run, current session: Select to replace the previous run of the current session. • In any run, any session: Select to replace the test of any previous run and session. Selecting this option enables a browse button which displays a list of previous sessions and runs to select.
Report Creation Settings	
Report name	Displays the name and location from which to open a report. The default location is at *\My TekExpress\USB4\Untitled Session*. 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. **Change the report name or location** Do one of the following: • In the Report Path field, type over the current folder path and name. • Double-click in the Report Path field and then make selections from the popup keyboard and click the **Enter** button. **Note:** 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\USB4\DUT001_Test_72.7.1.3.mht. **Open an existing report** Click **Browse**, locate and select the report file and then click **View** at the bottom of the panel.
Save as type	Saves a report in the selected output format (Web archive, PDF or CSV).
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.
Contents To Save	
Include pass/fail info in details table	Select to include the column labeled Test Results (indicating whether the test passed or failed) in the report. For details, see Report Contents in *View a report*.

Table continued…

Setting	Description
Include detailed results	Includes detailed results in the report **Note:** If Include detailed results is deselected, Include pass/fail info in details table will be deselcted.
Include plot images	Sets the application to include plots such as Eye diagrams.
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, probe model and serial number, the oscilloscope firmware version, SPC and factory calibration status, 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 added in the DUT tab of the Setup panel. Comments appear in the Comments section, under the summary box at the beginning of each report.
View Report After Generating	Automatically opens the report in a Web browser when the test completes. This option is selected by default.
View	Click to view the most current report.
Generate Report	Generates a new report based on the current (most-recent) analysis results.
Save As	Specify a name for the report.

View a report

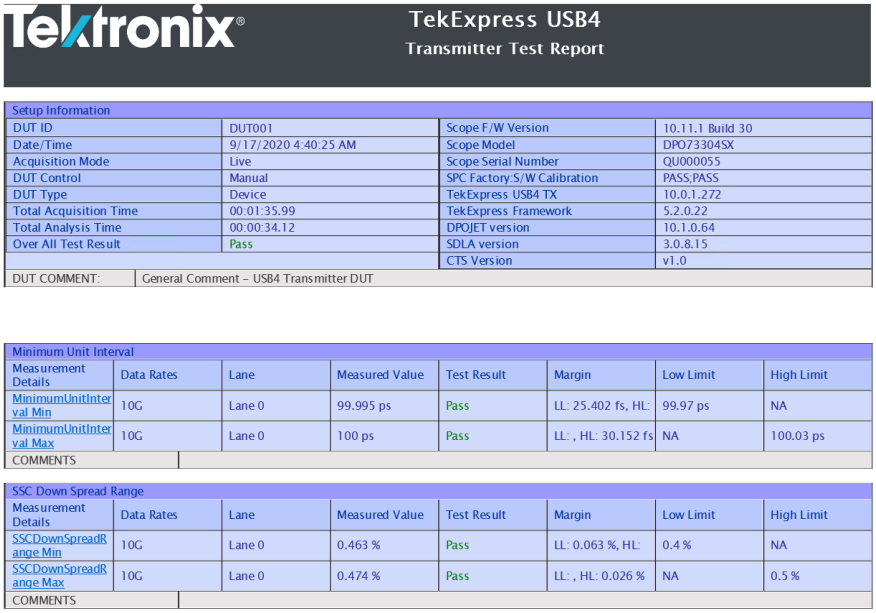
The application automatically generates a report when test analysis is completed and displays the report in your default Web browser (unless you cleared the **View Report After Generating** check box in the Reports panel before running the test). If you cleared this check box, or to view a different test report, do the following:

1. Click the **Reports** button.
2. Click the **Browse** button and locate and select the report file to view.
3. In the Reports panel, click **View**.

For information on changing the file type, file name, and other report options, see *Select report options*.

Report contents

A report shows specified test details, such as detailed results and plots, as set in the Reports panel.



TekExpress USB4
Transmitter Test Report

Setup Information			
DUT ID	DUT001	Scope F/W Version	10.11.1 Build 30
Date/Time	9/17/2020 4:40:25 AM	Scope Model	DPO73304SX
Acquisition Mode	Live	Scope Serial Number	QU000055
DUT Control	Manual	SPC Factory S/W Calibration	PASS,PASS
DUT Type	Device	TekExpress USB4 TX	10.0.1.272
Total Acquisition Time	00:01:35.99	TekExpress Framework	5.2.0.22
Total Analysis Time	00:00:34.12	DPOJET version	10.1.0.64
Over All Test Result	Pass	SDLA version	3.0.8.15
		CTS Version	v1.0
DUT COMMENT:	General Comment – USB4 Transmitter DUT		

Minimum Unit Interval							
Measurement Details	Data Rates	Lane	Measured Value	Test Result	Margin	Low Limit	High Limit
MinimumUnitInterval Min	10G	Lane 0	99.995 ps	Pass	LL: 25.402 fs, HL:	99.97 ps	NA
MinimumUnitInterval Max	10G	Lane 0	100 ps	Pass	LL: , HL: 30.152 fs	NA	100.03 ps
COMMENTS							

SSC Down Spread Range							
Measurement Details	Data Rates	Lane	Measured Value	Test Result	Margin	Low Limit	High Limit
SSCDownSpreadRange Min	10G	Lane 0	0.463 %	Pass	LL: 0.063 %, HL:	0.4 %	NA
SSCDownSpreadRange Max	10G	Lane 0	0.474 %	Pass	LL: , HL: 0.026 %	NA	0.5 %
COMMENTS							

Setup configuration information

Setup configuration information is listed in the summary box at the beginning of the report. This information includes the oscilloscope model and serial number, and software versions. To exclude this information from a report, clear the **Include Setup Configuration** check box in the Reports panel before running the test.

User comments

If you selected to include comments in the test report, any comments you added in the DUT tab are shown at the top of the report.

Test result summary

The Test Result column indicates whether a test passed or failed. If the test passed, the cell text is green. If the test failed, the text is red. To exclude this information from a report, clear the **Include Pass/Fail Results Summary** check box in the Reports panel before running the test.

See also

Results panel overview

View test-related files

Running tests

Test process flow

Use the following list to set up and performing USB4 tests.

1. Allow test instruments to warm up (~20 minutes).
2. *Deskew the real-time oscilloscope*.
3. *Set up test equipment*.
4. *Verify that required instruments are connected to USB4*.
5. *Set DUT parameters*.
6. *Select tests*.
7. *View acquisition settings*.
8. Set global signal-related parameters.
9. *Select test notification preferences*.
10. *Select report options*.
11. *Check the prerun checklist*
12. Click **Start** to *Run tests*.

See also

About test setups

About running tests

Deskew real-time oscilloscopes

Use the following procedure to deskew direct input SMA channels on a real time oscilloscope.

Note: DPOJET has an automatic deskew option under. Refer to your DPOJET online help for information on how to deskew the channels.

1. Run Signal Path Compensation (SPC) on the oscilloscope.
2. Connect a SMA Power Splitter (preferred) or SMA 50 Ω coaxial “T” connector to the Fast Edge output of the oscilloscope.
3. Connect SMA cables from each of the two channels to be deskewed to the power splitter (or SMA coaxial “T” connector). It is best to use matched cables when making high speed serial measurements. **It is important to use the same cables during deskew that you will use for subsequent measurements**.
4. Select **Default Setup**, and then select **Autoset** on the oscilloscope front panel.
5. Set the oscilloscope for 70% to 90% full screen amplitude on both channels. Center both traces so that they overlap.
6. Make sure that volts/div, position, and offset are identical for the two channels being deskewed.
7. Set the time/div to approximately 100 ps/div or less, with sample rate at 1 ps/pt. These settings are not critical, but should be close.
8. Set the horizontal acquisition mode to average, which provides a more stable display.
9. Select **Deskew** from the **Vertical** menu.
10. Verify that the reference channel (typically CH1 or CH2) is set to 0 ps deskew.
11. In the deskew control window, select the channel to deskew (typically CH3 or CH4). Adjust the deskew to overlay the rising edge as best as possible.

Note: Typical values are in the 10’s of ps or less with cables connected directly from Fast Edge to SMA inputs. If you are using a switch box (for example, Keithley), deskew the complete path from where the test fixture connects, through the switch, and into the oscilloscope. Deskew values in these cases may be as much as 30 ps or more.

Note: There can be significant differences in the skew between two TCA-SMA adapters. If you find that a system requires a very large correction, obtain a pair of TCA-SMA adapters that closely match each other to reduce the amount of correction.

Note: TekExpress retains the user configured Deskew values, and does not override the values during test runs.

Instrument and DUT 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

View connected instruments

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 USB4 application on top, select **Keep On Top** from the TekExpress Options menu.

See also

Configuration tab parameters

Prerun checklist

Do the following before you click Start to run a test:

Note: If this is the first time you are running a test on the application, make sure that you have done the steps in *Required My TekExpress folder settings* before continuing.

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**.
   c. Follow the on-screen instructions.
3. Verify that the correct instruments are connected (oscilloscope and signal sources):
   a. In TekExpress USB4, click **Setup > Configuration**.
   b. Click **Global Settings**.
   c. In the **Instruments Detected** list, verify that the test setup instruments are shown. If they are not, click the arrow button to list and select from all detected instruments. If the required instrument is still not listed, use the TekExpress Instrument Control Settings dialog box to scan for and detect instruments (see *View connected instruments*).

See also

Instrument and DUT connection setup

Saving and recalling test setup files

Test setup files overview

Saved test setup information (such as the selected oscilloscope, general parameters, acquisition parameters, measurement limits, waveforms (if applicable), and other configuration settings) are all saved under the setup name at **X:\USB4**.

Use test setups to:

- Run a new session, acquiring live waveforms, using a saved test configuration.
- Create a new test setup based on 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.

See also

Save a test setup

Recall a saved test setup

Save a test setup file

Save a test setup before or after running a test to save the test settings. Create a new test setup from any open setup or from the default setup. When you select the default test setup, all parameters are returned to the application's default values.

To immediately save the current setup session to the same setup name, select **Options > Save Test Setup**.

To immediately save the current setup session to a new setup name, select **Options > Save Test Setup As**.

To create and save a new setup from the default test setup:

1. Select **Options > Default Test Setup** to return the application to default test settings.
2. Click the application **Setup** button and use the setup tabs to set required options and parameters (DUT, Test Selection, and so on).
3. Click the application **Reports** button and set your *report options*.
4. Optional: Click **Start** to run the test and verify that it runs correctly and captures the specified test information and reports. If it does not, edit the parameters and repeat this step until the test runs to your satisfaction.

   Running the test helps verify that all parameters are set correctly, but it is not a necessary step.
5. Select **Options > Save Test Setup**. Enter the file name for the new setup file. The application saves the file to X:\USB4\<*session_name*>.

See also

Test process flow

View test-related files

Configuration tab parameters

Open (load) a saved test setup file

These instructions are for recalling saved test setups.

1. Select **Options > Open Test Setup**.
2. Select the setup from the list and click **Open**. Setup files must be located at **X:\USB4**.

See also

About test setups

Create a new test setup based on an existing one

Test setups overview

Run a saved test in prerecorded mode

Run a saved test in prerecorded mode

Use this option to re-run a complete test using just the oscilloscope and the saved test setup files, if you selected to save the captured waveforms when you originally ran the saved test.

Note: When you run a saved test in prerecorded mode and then save it under the same name, the test results are saved in a new session folder named for the date and time of the session. Any test settings that you changed for the session are saved as a new test session file and be paired with a folder of the same name. Example. When you open a test setup that has multiple sessions and you select a session from the Run session list in the DUT tab, the settings associated with that test session are restored.

Each test session folder has a matching test session file that stores the individual test settings for that session.

1. Use the Options menu to *Open a saved test setup file*
2. Select **Setup > DUT** and then select **Use pre-recorded waveform files**. A Run session drop-down list appears that displays the previous saved sessions for this test.
3. Select the session to run. NOTE. If you select a session for which no waveform files were saved, you will receive an error message. You have selected to use Pre-recorded waveforms. The pre-recorded waveform(s) are not specified for the following Acquisition(s).
4. Click **Start**.
5. To save the test results, session settings, and related files, save the test setup before selecting another test setup or exiting the application.

See also

About test setups

Create a new test setup based on an existing one

Test setups overview

Create a new test setup file based on an existing one

Use this method to create a variation on a test setup without having to create the setup from the beginning.

1. Select **Options > Open Test Setup**.
2. Select a setup from the list and then click **Open**.
3. Use the **Setup** and **Reports** panels to modify the parameters to meet your testing requirements.
4. Select **Options > Save Test Setup As**.
5. Enter a test setup name and click **Save**.

See also

About test setups

Set DUT parameters

Select acquisitions

SCPI commands

About SCPI command

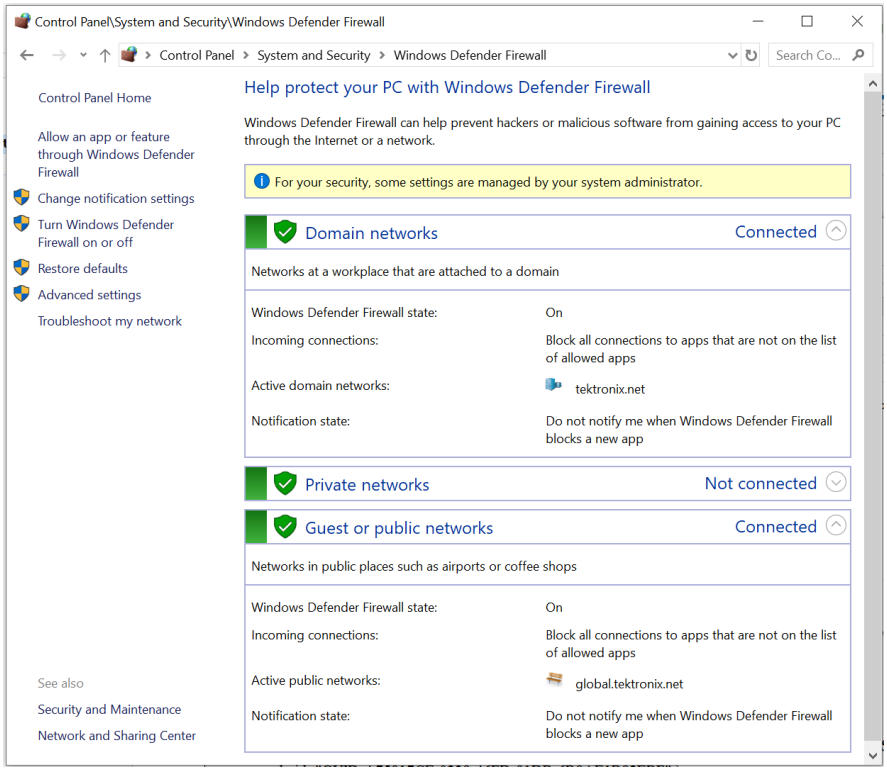
You can use Standard Commands for Programmable Instruments (SCPI) to communicate with the TekExpress application.

Socket configuration for SCPI commands

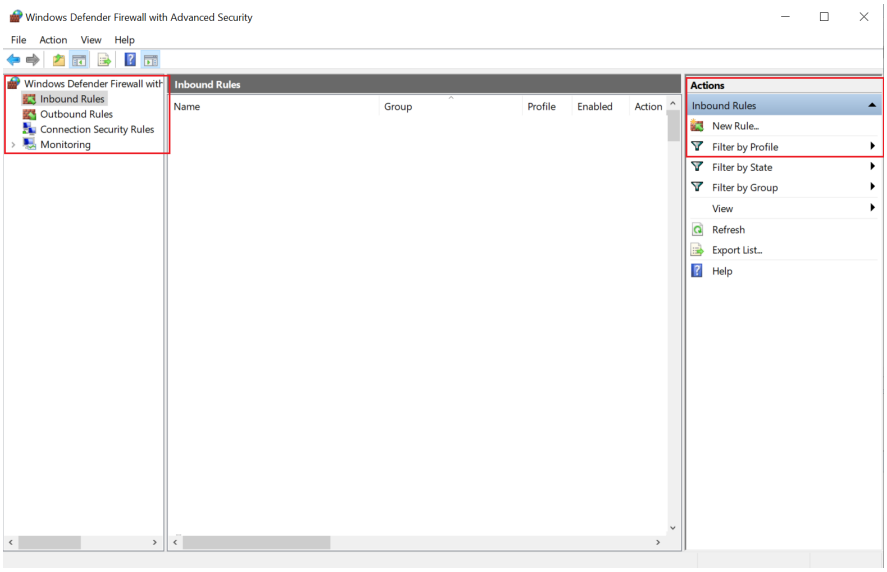
This section describes the steps for TCP/IP socket configuration and TekVISA configuration to execute the SCPI commands.

TCP/IP socket configuration

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

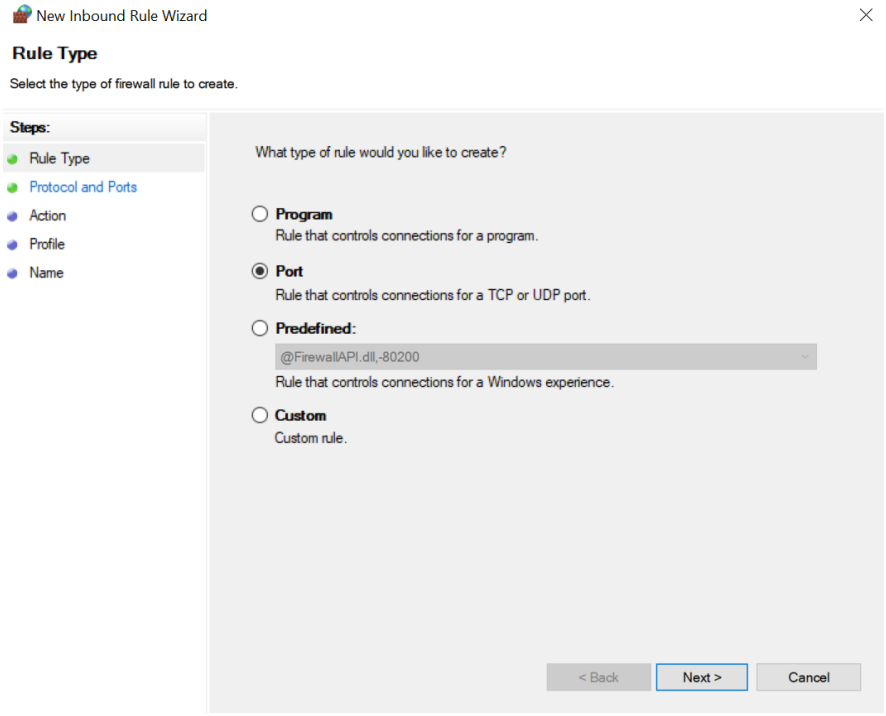


2. In Windows Firewall with Advanced Security menu, select **Windows Firewall with Advanced Security on Local Computer** > **Inbound Rules** and click New Rule…

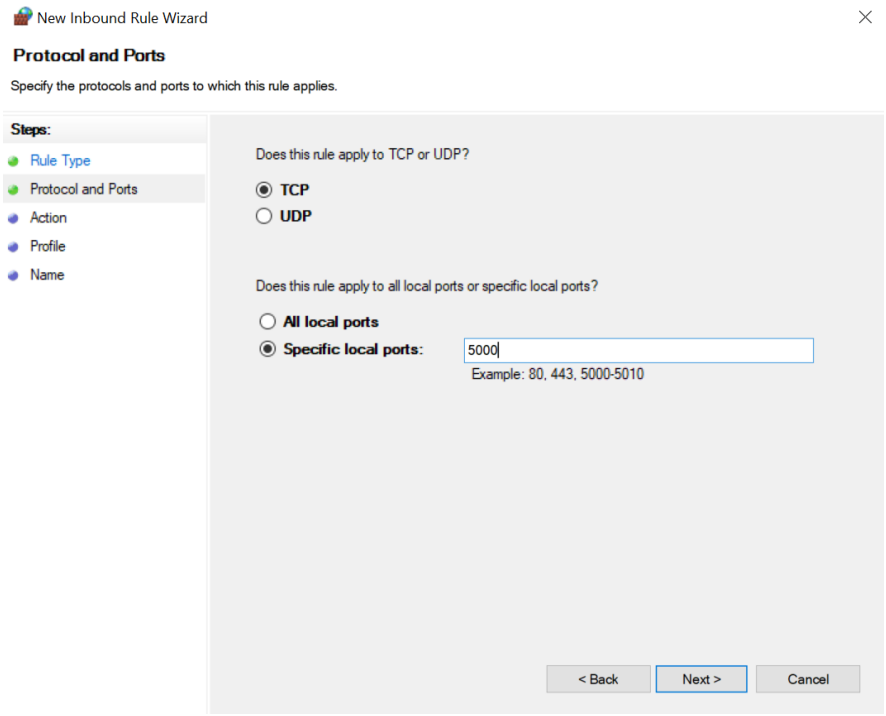


3. In New Inbound Rule Wizard menu

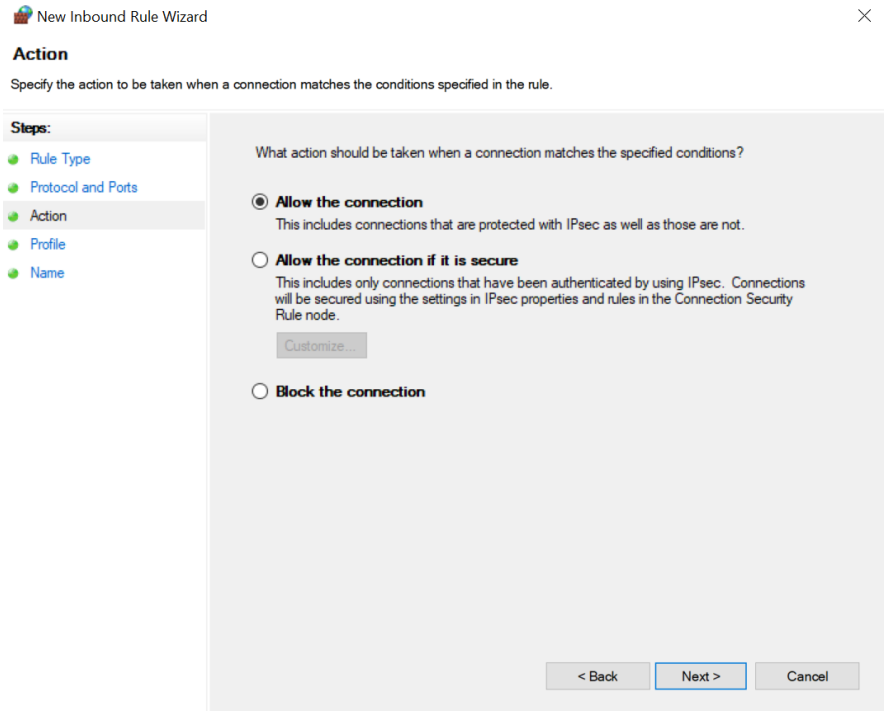
   a. Select **Port** and click **Next**.



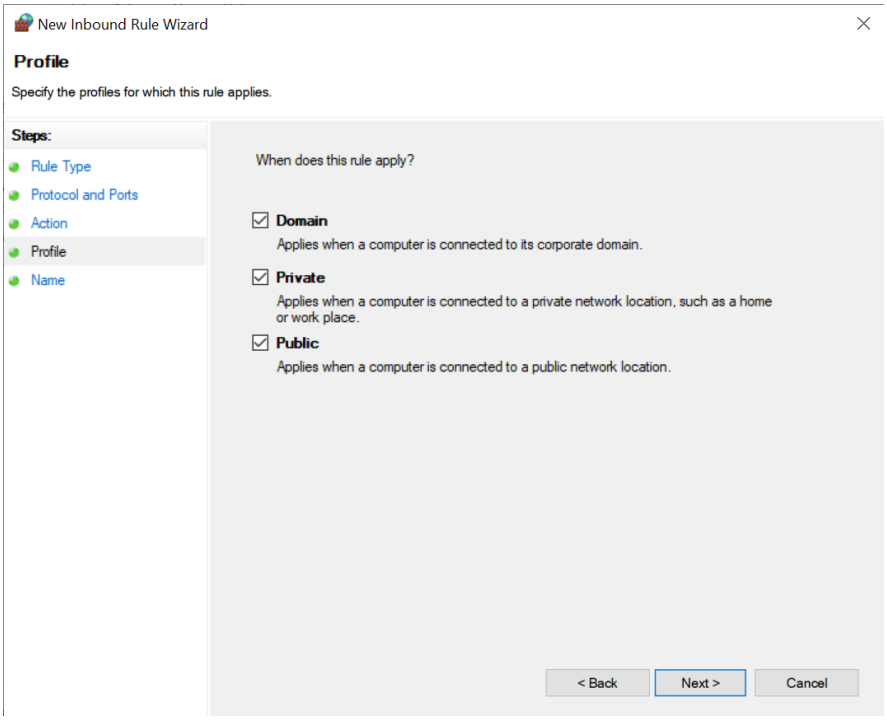
   b. Select **TCP** as rule apply and enter 5000 for **Specific local ports** and click **Next**.



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

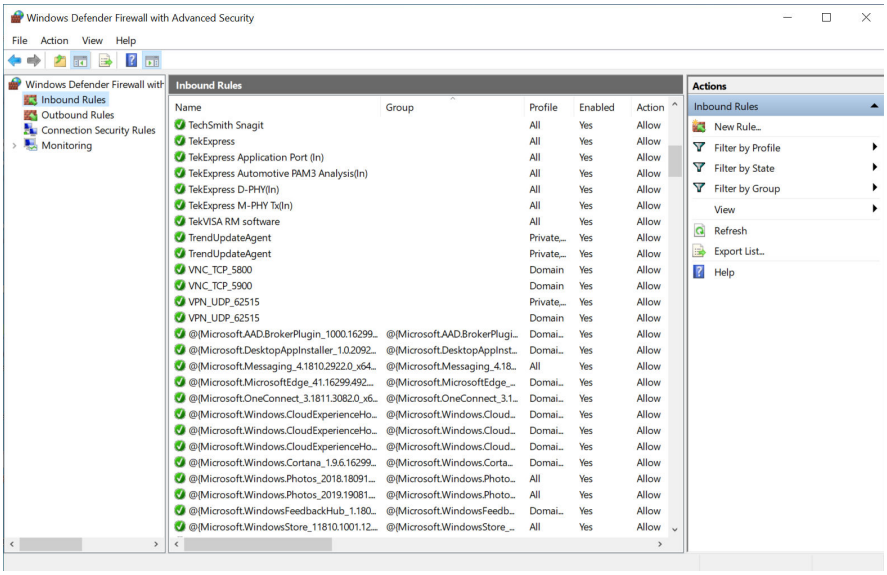


d. Select **Domain, Private, Public** and click **Next**.



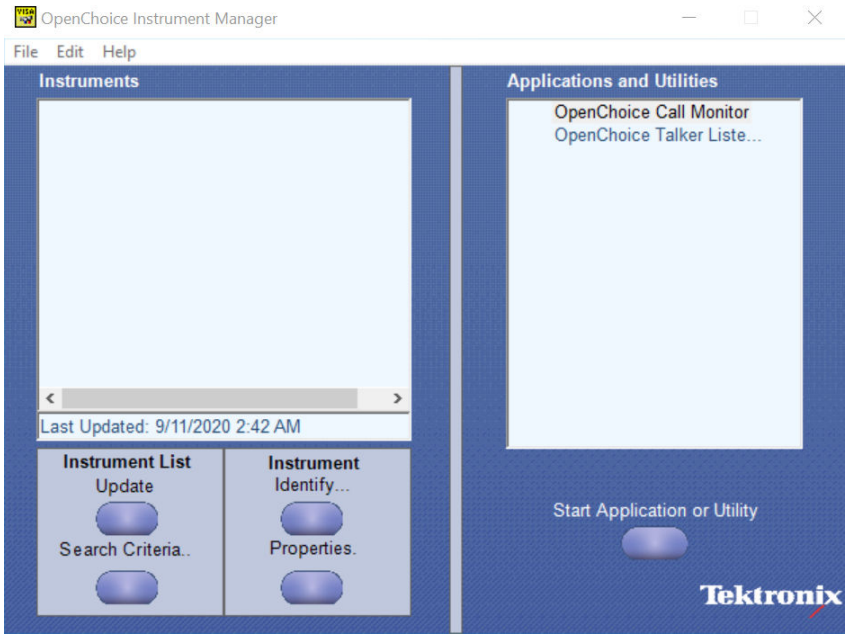
e. Enter **Name**, Description (optional), and click **Finish**.

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



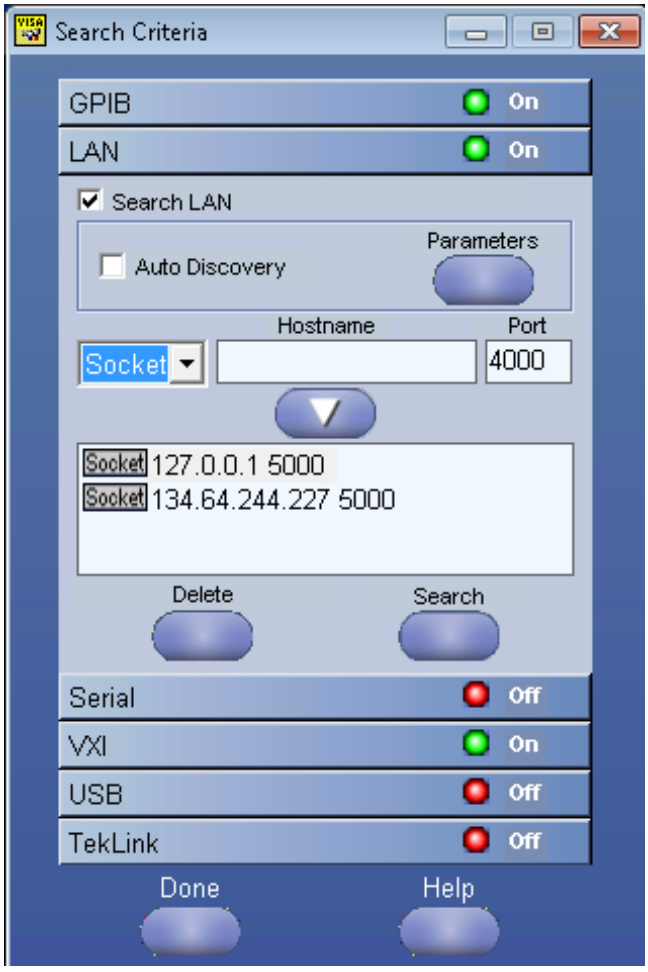
TekVISA configuration

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

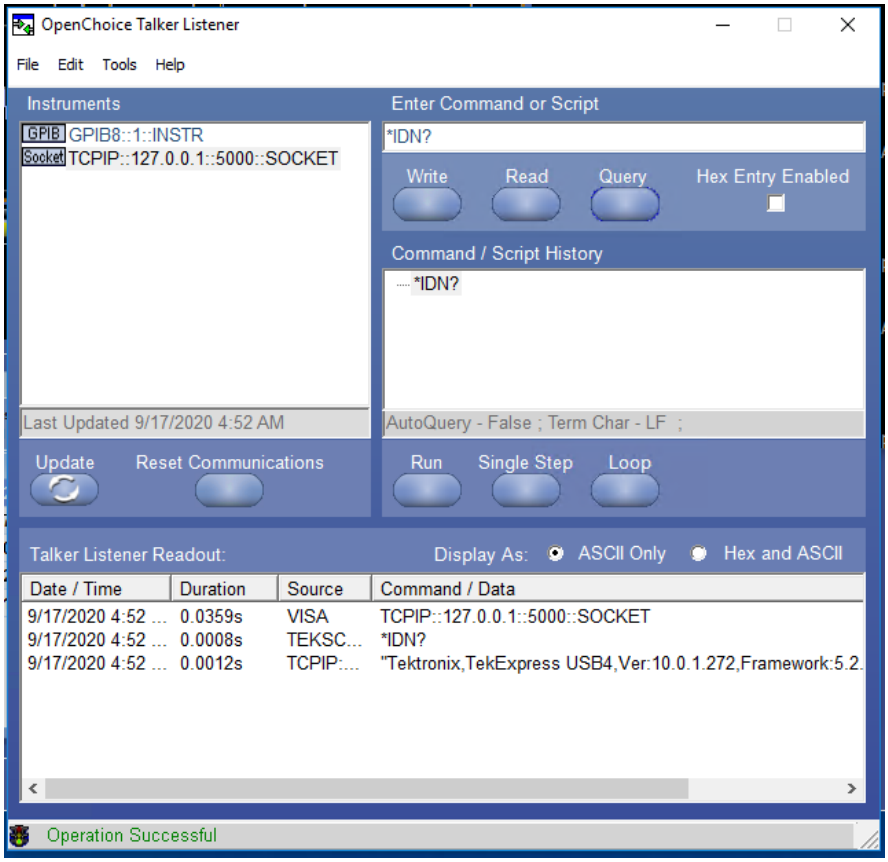


2. Click **Search Criteria**. In Search Criteria menu, click **LAN** to Turn-on. Select **Socket** from the drop-down list, enter the IP address of the TekExpress device in **Hostname** and type **Port** as 5000. Click  to configure the IP address with Port.

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



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.



TEKEXP:*IDN?

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

Syntax

```
TEKEXP:*IDN?\n
```

Inputs

NA

Outputs

Returns active TekExpress application name running on the oscilloscope.

TEKEXP:*OPC?

This command queries the execution status of the last executed command.

Syntax

```
TEKEXP:*OPC?\n
```

Inputs

NA

Outputs

0 - last command execution is not complete

1 - last command execution is complete

TEKEXP:ACQUIRE_MODE

This command sets the acquire mode as live or pre-recorded.

Syntax

```
TEKEXP:ACQUIRE_MODE {LIVE | PRE-RECORDED}\n
```

Inputs

```
{LIVE | PRE-RECORDED}
```

Outputs

NA

TEKEXP:ACQUIRE_MODE?

This command queries the acquire mode type.

Syntax

```
TEKEXP:ACQUIRE_MODE?\n
```

Inputs

```
NA
```

Outputs

```
{LIVE | PRE-RECORDED}
```

TEKEXP:EXPORT

This command returns all the bytes of data to the specified file.

Syntax	Outputs
`TEKEXP:EXPORT REPORT\n`	Returns the report file in bytes
`TEKEXP:EXPORT WFM,"<FileName>"\n`	Returns the specified waveform file in bytes
`TEKEXP:EXPORT IMAGE,"<FileName>"\n`	Returns the specified image file in bytes

Inputs

`FileName` - Specifies the file name

TEKEXP:INFO?

This command queries the information about the file(s).

Syntax	Outputs
`TEKEXP:INFO? REPORT\n`	<ReportFileSize>,"<ReportFileName.mht>"

Table continued…

Syntax	Outputs
`TEKEXP:INFO? WFM \n`	<WfmFile1Size>,"<WfmFileName1.wfm>";<WfmFile2Size>,"<WfmFileName2.wfm>";...
`TEKEXP:INFO? IMAGE\n`	<Image1FileSize>,"<Image1FileName>";<Image2FileSize>,"<Image2FileName>" ;...

TEKEXP:INSTRUMENT

This command sets the value for the selected instrument type.

Syntax

```
TEKEXP:INSTRUMENT "<InstrumentType>",<Value>"\n
```

Inputs

`InstrumentType`

`Value`

Tip: Check *Command parameters list* section for InstrumentType and Value parameters.

Outputs

NA

TEKEXP:INSTRUMENT?

This command queries the instrument selected for the specified instrument type.

Syntax

```
TEKEXP:INSTRUMENT? "<InstrumentType>"\n
```

Inputs

`InstrumentType`

Tip: Check *Command parameters list* section for InstrumentType parameters.

Outputs

Returns the instrument selected for the specified instrument type

TEKEXP:LASTERROR?

This command queries the last error string occurred for the current TCP session. If there are no errors since startup, or since the last call to TEKEXP:LASTERROR?\n, this command returns an empty string.

Syntax

```
TEKEXP:LASTERROR?\n
```

Inputs

NA

Outputs

<string>

TEKEXP:LIST?

This command queries the list of available device, suite, test, version or instrument.

Syntax	Outputs
`TEKEXP:LIST? DEVICE\n`	Returns the list of available device(s) as comma separated values.
`TEKEXP:LIST? SUITE\n`	Returns the list of available suite(s) as comma separated values.
`TEKEXP:LIST? TEST\n`	Returns the list of available test(s) as comma separated values.
`TEKEXP:LIST? VERSION\n`	Returns the list of available version(s) as comma separated values.
`TEKEXP:LIST? INSTRUMENT,"<InstrumentType>"\n`	Returns the list of available instruments' for the given Instrument type as comma separated values.

Note: This command returns the list of items within double quotes (""). Iterate the receive procedure until the list ends with double quotes otherwise the next query commands won't work as expected.

Inputs

`InstrumentType`

Tip: Check *Command parameters list* section for InstrumentType parameters.

TEKEXP:POPUP

This command sets the response to the active popup shown in the application.

Syntax

`TEKEXP:POPUP "<PopupResponse>"\n`

Inputs

`PopupResponse`

Outputs

NA

TEKEXP:POPUP?

This command queries the active popup information shown in the application.

Syntax

`TEKEXP:POPUP?\n`

Inputs

`NA`

Outputs

Returns the active popup information in the application.

TEKEXP:REPORT

This command generates the report for the current session.

Syntax

`TEKEXP:REPORT GENERATE\n`

Inputs

`GENERATE`

Outputs

NA

TEKEXP:REPORT?

This command queries the queried header field value in the report.

Syntax

`TEKEXP:REPORT? "<HeaderField>"\n`

Inputs

`HeaderField` - Specifies to return the measured value for the indicated test.

Tip: Check **Report** for HeaderField parameters.

Outputs

Returns the queried header field value in the report

TEKEXP:RESULT?

This command queries the result available in report summary/details table.

Syntax	Outputs
`TEKEXP:RESULT? "<TestName>"\n`	Return Pass/Fail status of the test.
`TEKEXP:RESULT? "<TestName>","<ColumnName>"\n`	Returns all the row values of the specified column for the test.
`TEKEXP:RESULT? "<TestName>","<ColumnName>",<RowNumber>\n`	Returns the column value for the specified row number

Inputs

`TestName` - Specifies the name of the test for which to obtain the test result value.

`ColumnName` - Specifies the column name for the measurement

`RowNumber` - Specifies the row number of the measurement

Tip: Check **Results** panel for TestName, ColumnName, and RowNumber parameters.

TEKEXP:SELECT

This command selects the device, suite, version, or test.

Syntax

```
TEKEXP:SELECT <string1>,<string2>,<string4>\n
TEKEXP:SELECT TEST,<string3>,<string4>\n
```

Inputs

```
<string1> = {DEVICE | SUITE | VERSION}
<string2> = {DeviceName | SuiteName | VersionName}
<string3> = {"<TestName>"| ALL| REQUIRED }
<string4> = {TRUE | FALSE}
```

Tip: Check *Command parameters list* section for DeviceName, SuiteName, VersionName, and TestName parameters.

Outputs

NA

TEKEXP:SELECT?

This command queries the name of the selected device, suite, version, or test.

Syntax

```
TEKEXP:SELECT? {DEVICE | SUITE | TEST | VERSION}\n
```

Inputs

```
{DEVICE | SUITE | TEST | VERSION}
```

Outputs

Returns the name of the selected device, suite, version, or test.

TEKEXP:SETUP

This command sets the value of the current setup.

Syntax	Outputs
`TEKEXP:SETUP DEFAULT\n`	Restore to default Setup
`TEKEXP:SETUP OPEN,"<SessionName>"\n`	Open the session
`TEKEXP:SETUP SAVE\n`	Saves the already existing modified session
`TEKEXP:SETUP SAVE,"<SessionName>"\n`	Save the session

Inputs

`SessionName` - The name of the session

TEKEXP:STATE

This command sets the execution state of the application.

Syntax

```
TEKEXP:STATE {RUN | STOP | PAUSE | RESUME}\n
```

Inputs

```
{RUN | STOP | PAUSE | RESUME}
```

Outputs

NA

TEKEXP:STATE?

This command queries the current setup state.

Syntax	Outputs
`TEKEXP:STATE?`	RUNNING | PAUSED | WAIT | ERROR | READY
`TEKEXP:STATE? SETUP`	SAVED | NOT_SAVED

TEKEXP:VALUE

This command sets the value of parameters of type General, Acquire, Analyze, or DUTID.

Syntax

```
TEKEXP:VALUE GENERAL,"<ParameterName>",“<Value>”\n
TEKEXP:VALUE ACQUIRE,“<TestName>","<AcquireType>", "<ParameterName>", “<Value>”\n
TEKEXP:VALUE ANALYZE,“<TestName>","<ParameterName>".“<Value>”\n
TEKEXP:VALUE DUTID,“<Value>”\n
TEKEXP:VALUE VERBOSE,{TRUE | FALSE}\n
TEKEXP:VALUE WFMFILE,<Test_Name>,<Aquire_Type>,<FilesName1$FileName2>\n
```

Inputs

`ParameterName` - Specifies the parameter name

`TestName` - Specifies the test name

`AcquireType` - Specifies the acquire type

`Value` - Specifes the value to set

`FilesName1$FileName2` - Specifies the waveform file name

`TRUE` - Pop-ups are enabled

`FALSE` - Pop-ups are disabled

Tip: Check *Command parameters list* section for ParameterName, AcquireType, and Value parameters.

Outputs

NA

TEKEXP:VALUE?

This command queries the value of the parameter for type General, Acquire, Analyze, or DUTID.

Syntax	Outputs
`TEKEXP:VALUE? GENERAL,"<ParameterName>"\n`	Returns the value of Parameter for type GENERAL
`TEKEXP:VALUE? ACQUIRE,"<TestName>", "<AcquireType>","<ParameterName>"\n`	Returns the value of Parameter for type ACQUIRE
`TEKEXP:VALUE? ANALYZE, "<TestName>","<ParameterName>"\n`	Returns the value of Parameter for type ANALYZE
`TEKEXP:VALUE? DUTID\n`	Returns the DUTID value
`TEKEXP:VALUE? WFMFILE,<Test_Name>,<Aquire_Type>\n`	Returns the waveform file name
`TEKEXP:VALUE? VERBOSE`	Returns the verbose mode type

Inputs

`ParameterName` - Specifies the parameter name

`TestName` - Specifies the test name

`AcquireType` - Specifies the acquire type

`TRUE` - Pop-ups are enabled

`FALSE` - Pop-ups are disabled

Tip: Check *Command parameters list* section for ParameterName and AcquireType parameters.

Outputs

Returns the value of Parameter for type GENERAL | ACQUIRE | ANALYZE | DUTID.

Command parameters

This section provides the parameters list for the SCPI commands.

TekExpress USB4 command parameters

ParameterName and Value for DUT, Test selection, Acquisition, Configuration, and Preferences tabs

Specifies the ParameterName and Value for DUT, Test selection, Acquisition, Configuration, and Preferences tabs

Table 14: ParameterName and Value for DUT tab

ParameterName	Value
InstrumentType	Specifies the instrument type. Valid value is Real Time Scope.
DeviceName	Specifies the acquire mode parameter: USB4
SuiteName	Device Host
DataRate Rounded 10 Gbps Option button	Included Excluded
DataRate Rounded 20 Gbps Option button	Included Excluded
Lane Selection	Lane0 Lane1
DUT Automation	Manual Automated
Embed/De-embed port selection for:	
Port Selection 1	Port 1
Port Selection 2	Port 2 Port 3
Port Selection 3	Port 2 Port 3
Port Selection 4	Port 4

Table 15: ParameterName and Value for Test Selection tab

ParameterName	Description
Specifies the test measurement name.	Selects\deselects the given test name. Valid values are: • TRUE • FALSE
TP2 • Minimum Unit Interval 10 G • SSC Down Spread Range 10 G • SSC Down Spread Rate 10 G • SSC Phase Deviation 10 G • SSC Slew Rate 10 G • Rise Fall Time 10 G • Electrical Idle 10 G • TJ (Total Jitter) TJ using PRBS15 10 G TJ using SQ2 10 G • UJ (Uncorrelated Jitter) 10 G • UDJ (Uncorrelated Deterministic Jitter) 10 G • DDJ (Data Dependent Jitter) 10 G • UDJ_LF (Low Frequency Uncorrelated Deterministic Jitter) 10 G • DCD (Duty Cycle Distortion) 10 G • AC Common Mode 10 G • Eye Diagram TP2 10 G	
TP3 • Total Jitter TP3 TJ TP3 using PRBS15 10 G TJ TP3 using SQ2 10 G • UJ TP3 (Uncorrelated Jitter TP3) 10 G • DJ TP3 (Uncorrelated Deterministic Jitter TP3) 10 G • Eye Diagram TP3 10 G	

Table continued…

ParameterName	Description
Transmitter Equalization • Preset 0 10 G • Preset 1 10 G • Preset 2 10 G • Preset 3 10 G • Preset 4 10 G • Preset 5 10 G • Preset 6 10 G • Preset 7 10 G • Preset 8 10 G • Preset 9 10 G • Preset 10 10 G • Preset 11 10 G • Preset 12 10 G • Preset 13 10G • Preset 14 10G • Preset 15 10G	Selects\deselects the given test name. Valid values are: • TRUE • FALSE
TP2 • Minimum Unit Interval 20 G • SSC Down Spread Range 20 G • SSC Down Spread Rate 20 G • SSC Phase Deviation 20 G • SSC Slew Rate 20 G • Rise Fall Time 20 G • Electrical Idle 20 G • TJ (Total Jitter) TJ using PRBS15 20 G TJ using SQ2 20 G • UJ (Uncorrelated Jitter) 20 G • UDJ (Uncorrelated Deterministic Jitter) 20 G • DDJ (Data Dependent Jitter) 20 G • UDJ_LF (Low Frequency Uncorrelated Deterministic Jitter) 20 G • DCD (Duty Cycle Distortion) 20 G • AC Common Mode 20 G • Eye Diagram TP2 20 G	

Table continued…

ParameterName	Description
TP3 • Total Jitter TP3 TJ TP3 using PRBS15 20 G TJ TP3 using SQ2 20 G • UJ TP3 (Uncorrelated Jitter TP3) 20 G • DJ TP3 (Uncorrelated Deterministic Jitter TP3) 20 G • Eye Diagram TP3 20 G	Selects\deselects the given test name. Valid values are: • TRUE • FALSE
Transmitter Equilization • Preset 0 20 G • Preset 1 20 G • Preset 2 20 G • Preset 3 20 G • Preset 4 20 G • Preset 5 20 G • Preset 6 20 G • Preset 7 20 G • Preset 8 20 G • Preset 9 20 G • Preset 10 20 G • Preset 11 20 G • Preset 12 20 G • Preset 13 20 G • Preset 14 20 G • Preset 15 20 G	

Table 16: ParameterName and Value for Acquisition tab

ParameterName	Value
Acquisition and Save Options	Saves the acquisitions and waveforms: Save All Waveforms Before Analysis
Signal Validation	Promput when signal fails Use signal as is - Dont Check Skip test if signal validation fails

Table 17: ParameterName and Value for Configuration tab

ParameterName	Value
Mode	Compliance Mode
Global Settings	Instruments Detected: Real Time Scope
Measurements	Displays the selected measurements to configure

Table continued…

ParameterName	Value
Gen2 CTLE Index	• 0 db • 1 db • 2 db • 3 db • 4 db • 5 db • 6 db • 7 db • 8 db • 9 db
Gen3 CTLE Index	• 0 db • 1 db • 2 db • 3 db • 4 db • 5 db • 6 db • 7 db • 8 db • 9 db
Gen3 Perform with DFE	Included Excluded
Gen2 Perform with DFE	Included Excluded
Gen2 CTLE Option	Fixed Optimize
Gen3 CTLE Option	Fixed Optimize

Table 18: ParameterName and Value for Preferences tab

ParameterName	Value
Auto close Warnings and informations during Sequencing	Included
Auto close after <no> Seconds	Excluded Value to be given in seconds

Table continued…

ParameterName	Value
Auto close Error Messages during Sequencing. Show in Reports. Auto close after <no> Seconds	Included Excluded Value to be given in seconds
Show messages with a beep sound.	Included Excluded

Table 19: ParameterName and Value for General

ParameterName	Value
PortSelection1	Port1
PortSelection2	• Port2 • Port3
PortSelection3	• Port2 • Port3
PortSelection4	Port4
Gen2 CTLE Option	• Fixed • Optimize
Gen2 Ctle Index	• 0 db • 1 db • 2 db • 3 db • 4 db • 5 db • 6 db • 7 db • 8 db • 9 db
Gen2 Perform DFE Checkbox	• Included • Excluded

Table continued…

ParameterName	Value
Gen3 Ctle Option	• Fixed • Optimize • 0 db • 1 db • 2 db • 3 db • 4 db • 5 db • 6 db • 7 db • 8 db • 9 db
Gen3 Perform DFE Checkbox	• Included • Excluded
PresetGen2	The following selects the preset calibration measurements: • P0 • P1 • P2 • P3 • P4 • P5 • P6 • P7 • P8 • P9 • P10 • P11 • P12 • P13 • P14 • P15

Table continued…

ParameterName	Value
PresetGen3	The following selects the preset calibration measurements: • P0 • P1 • P2 • P3 • P4 • P5 • P6 • P7 • P8 • P9 • P10 • P11 • P12 • P13 • P14 • P15
Example 1: TEKEXP: VALUE GENERAL, "PresetGen2, "P1_P11_P7".	This selects presets 1, 7, and 11 from preset cal Gen2
Example 2: TEKEXP: VALUE GENERAL, "PresetGen2, "P1_P11_P7_P8".	Value Should contain the following: If preset 8 needs to be added along with the selected presets, then the existing presets along with preset 8 must be specified in the command.
Data+	• CH1 • CH2 • CH3 • CH4
Data-	• CH1 • CH2 • CH3 • CH4
Report Update Mode	• New • Append • Replace • Replace Any
Email when test setup change in needed	• True • False
Append Report	• True • False

Table continued…

ParameterName	Value
Auto increment report name if duplicate	• True • False
Include pass/fail results summary	• Included • Excluded
Include detailed results	• True • False
Include plot images	• True • False
Include setup configuration	• True • False
Include user comments	• True • False
Include Header in apended reports	• True • False
Include report at the end	• True • False
Save As Type	• PDF (*.pdf;) • Web Archive (*.mht;*.mhtml) • CSV (*.csv;)
Report Generation Template Path	C:\ProgramFiles\Tektronix\TekExpress\TekExpressUSB4\ReportGenerator \TekExpress_Template_GroupByTestName_CSV.xsl
Report Path	X:\USB4\Reports\USB4.csv
View Report After Generating	• True • False
Report Group Mode	• Test Name • Lane Name

Examples

This section provides the examples for the SCPI commands.

Example	Description
`TEKEXP:*IDN?`	It returns the active TekExpress application name running on the scope.
`TEKEXP:*OPC?`	It returns the last command execution status, if status is executed it returns "1" else "0".

Table continued…

Example	Description
TEKEXP:SELECT TEST	+ ParameterName+ "," + value
TEKEXP:ACQUIRE_MODE PRE-RECORDED	It sets the acquire mode as pre-recorded.
TEKEXP:ACQUIRE_MODE?	It returns LIVE when acquire mode is set to live or it returns pre-recorded when acquire mode is set to pre-recorded.
TEKEXP:EXPORT REPORT	It returns the report file in bytes. This can be written into another file for further analysis.
TEKEXP:INFO? REPORT	It returns “100,”ReportFileName.mht””, when 100 is the file size in bytes for the filename ReportFileName.
TEKEXP:INFO? WFM	It returns “100,“WfmFileName1.wfm””;“200, “WfmFileName2.wfm”" when 100 is the filesize in bytes for the filename WfmFileName1.wfm and 200 is the file size in bytes for the filename WfmFileName2.wfm.
TEKEXP:INSTRUMENT "Real Time Scope",DPO73304SX (GPIB8::1::INSTR)	It sets the instrument value as DPO73304SX(GPIB8::1::INSTR) for the selected instrument type Real Time Scope.
TEKEXP:INSTRUMENT? "Real Time Scope"	It returns "DPO73304SX (GPIB8::1::INSTR), when DPO73304SX (GPIB8::1::INSTR)" is the selected instrument for the instrument type Real Time Scope.
TEKEXP:LASTERROR?	It returns ERROR: INSTRUMENT_NOT_FOUND, when no instrument is found.
TEKEXP:LIST? DEVICE	It returns "USB4" when TX-Device, RXDevice are the available device.
TEKEXP:LIST? INSTRUMENT,"Real Time Scope"	It returns "DPO73304SX (GPIB8::1::INSTR), DPO73304DX (TCPIP:: 134.64.248.91::INSTR)" when DPO73304SX (GPIB8::1::INSTR), DPO73304DX (TCPIP::134.64.248.91::INSTR) are the list of available instruments.
TEKEXP:MODE COMPLIANCE	It sets the execution mode as compliance or User Defined.
TEKEXP:MODE?	It returns COMPLIANCE when the execution mode is compliance or It returns USER-DEFINED when the execution mode is user defined.
TEKEXP:POPUP OK	It sets OK as the response to active popup in the application.
TEKEXP:POPUP?	It returns "OK", when OK is the active popup information shown in the application.
TEKEXP:REPORT GENERATE	It generates report for the current session.
TEKEXP:REPORT? "Scope Model Number"	Returns "DPO73304SX" when DPO73304SX is the scope model.
TEKEXP:REPORT? DUT ID	It returns "DUT001" when DNI_DUT001 is the DUT ID.
TEKEXP:RESULT? "1.1.1 Data Lane LP-TX Thevenin Output High Level Voltage (VOH)"	It returns Pass when the test result is Pass.

Table continued...

Example	Description
TEKEXP:RESULT? "1.1.1 Data Lane LP-TX Thevenin Output High Level Voltage (VOH)","Margin",1	It returns the 2nd Sub measurements Margin L and H values.
TEKEXP:SELECT DEVICE, USB4, TRUE	It selects USB4.
TEKEXP:SELECT? DEVICE	
TEKEXP:SETUP DEFAULT	It restores the application to default setup.
TEKEXP:STATE STOP	It stops the test execution.
TEKEXP:STATE?	It returns as READY when the application is ready to run next measurement.
TEKEXP:STATE? SETUP	It returns as NOT_SAVED when the current setup is not saved else it returns SAVED.
TEKEXP:VALUE GENERAL,"Test Mode","Escape"	It sets the Test Mode parameter value to Escape .
TEKEXP:VALUE? GENERAL,"Test Mode"	It returns "Escape" when Escape is the Test Mode value.
TEKEXP:SELECT TEST ,"1.1.1 Data Lane LP-TX Thevenin Output High Level Voltage (VOH)",True	Execute this command to select an individual test. This command will select "1.1.1 Data Lane LP-TX Thevenin Output High Level Voltage (VOH)" test in the Signal Test tab.
TEKEXP:VALUE ACQUIRE,"1.1.1 Data Lane LP-TX Thevenin Output High Level Voltage (VOH)","Data Lanes Acquisition In Escape Mode with Data As Trigger","Sample Rate (GS/s)",12.5	It sets Sample Rate Parameter value to 12.5.
TEKEXP:VALUE? ACQUIRE,"1.1.1 Data Lane LP-TX Thevenin Output High Level Voltage (VOH)","Data Lanes Acquisition In Escape Mode with Data As Trigger","Sample Rate (GS/s)"	It returns the value of Sample Rate,

Reference

Handle error codes

The return value of the remote automations at the server-end is OP_STATUS, which changes to a string value depending on its code, and is returned to the client. The values of OP_STATUS are as follows:

Code	Value	Description
-1	FAIL	The operation failed
1	SUCCESS	The operation succeeded
2	NOT FOUND	Server not found
3	LOCKED	The server is locked by another client, so the operation cannot be performed
4	UNLOCK	The server is not locked; lock the server before performing the operation
0	NULL	Nothing

Note: The Fail condition for PI commands occurs in any of the following cases:

If the server is locked, the application displays "Server is locked by another client".

If the session is unlocked, the application displays "Lock session to execute the command".

If the server is not found, the application displays " Server not found-Disconnect!".

If the fail condition is not one of the above types, the application displays "Failed".

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