

TekExpress® DisplayPort
Automated Compliance, Characterization, and Debug Solutions
Online Help

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TekExpress DisplayPort Online help, 076-0179-00.

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

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

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General Safety Summary

Review the following safety precautions to avoid injury and prevent damage to this product or any products connected to it.

To avoid potential hazards, use this product only as specified.

Only qualified personnel should perform service procedures.

While using this product, you may need to access other parts of a larger system. Read the safety sections of the other component manuals for warnings and cautions related to operating the system.

To Avoid Fire or Personal Injury

Connect and Disconnect Properly. Connect the probe output to the measurement instrument before connecting the probe to the circuit under test. Connect the probe reference lead to the circuit under test before connecting the probe input. Disconnect the probe input and the probe reference lead from the circuit under test before disconnecting the probe from the measurement instrument.

Observe All Terminal Ratings. To avoid fire or shock hazard, observe all ratings and markings on the product. Consult the product manual for further ratings information before making connections to the product.

Do Not Operate Without Covers. Do not operate this product with covers or panels removed.

Do Not Operate With Suspected Failures. If you suspect that there is damage to this product, have it inspected by qualified service personnel.

Avoid Exposed Circuitry. Do not touch exposed connections and components when power is present.

Terms in this Manual

These terms may appear in this manual:



WARNING. *Warning statements identify conditions or practices that could result in injury or loss of life.*



CAUTION. *Caution statements identify conditions or practices that could result in damage to this product or other property.*

Using Online Help

Select Help from the menu to open the help file. You can also find an electronic copy of the help file in the Documents directory on the 063-4068-XX DVD.

Tables of Contents (TOC) tab — Organizes the help into book-like sections. Select a book icon to open a section; select any of the topics listed under the book.

Index tab — Enables you to scroll a list of alphabetical keywords. Select the topic of interest to bring up the appropriate help page.

Search tab — Allows a text-based search.

Follow these steps:

1. Type the word or phrase you want to find in the search box. If the word or phrase is not found, try the Index tab.
2. Choose a topic in the lower box, and then select the Display button.

General Help Functions:

- Select the Print button from the Help topics menu bar to print a topic.
- To return to the previous window, select the Back button.
- Use hyperlinks to jump from one topic to another.
- If the back button is grayed out or a jump is not available, choose the Help Topics button to return to the originating help folder.

Related Documentation

In addition to this TekExpress DisplayPort Online Help, the following documentation is included with the software:

DisplayPort Standard Tektronix MOI for Sink Tests method of implementation document.




TekExpress DisplayPort Online Help (PDF version), Tektronix part number 077-0233-00.

Conventions

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 mechanical methods of choosing an option: using a mouse or using the touch screen.

Table 1: Icon descriptions

Icon	Meaning
	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.

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.
- Probes 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 and status messages text file.
- If possible, save the waveform on which you are performing the measurement as a .wfm file.

Forward the information to technical support using one of these methods:

- E-mail – techsupport@tektronix.com
- FAX – (503) 627-5695

Accessories

About the Efficere Test Fixture

The Efficere test fixtures ET-DP-TPA-S that facilitate Sink Compliance testing are manufactured and distributed by Efficere Technologies. Efficere ET-DP-TPA-S can also be ordered directly from Tektronix. Efficere specializes in the design of high-speed products with superior signal integrity. For more information, visit the Efficere Technologies Web site www.Efficere.com.

Minimum System Requirements

The minimum system requirements for a PC to run TekExpress are as follows:

Table 2: System requirements

Processor	Pentium 4/M or equivalent processor.
Operating System	Windows XP Service Pack 2.
Memory	512 MB of memory.
Hard Disk	Approximately 2 GB of available hard-disk space for the recommended installation, which includes full TekExpress installation and distributed components.
Drive	DVD drive
Display	Super VGA resolution or higher video adapter (800x600 minimum video resolution for small fonts or 1024x768 minimum video resolution for large fonts). The application is best viewed at 96 dpi display settings ¹ .
Software	<ul style="list-style-type: none"> ■ IConnect S-parameter software (80SSPAR) for Cable testing. ■ DPOJET and SerialXpress for Sink testing. ■ Microsoft Excel 2002 or above. ■ Microsoft Internet Explorer 6.0 SP1 or later. ■ Microsoft Photo Editor 3.0 or equivalent software for image files viewing. ■ Adobe Reader 6.0 or equivalent software for viewing portable document format (PDF) files.
Other Devices	<ul style="list-style-type: none"> ■ Microsoft compatible mouse or compatible pointing device. ■ Four USB ports (2 USB ports minimum). ■ PCI-GPIB or equivalent interface for instrument connectivity ².

¹ If TekExpress is running on an instrument having a video resolution lower than 800x600 (for example, sampling oscilloscope), it is recommended to connect a secondary monitor and this has to be enabled before launching the application.

² If TekExpress is installed on a Tektronix oscilloscope, the virtual GPIB port cannot be used by TekExpress for communicating with oscilloscope applications. If external devices like USB-GPIB or equivalent are used for instrument connectivity, ensure that the Talker Listener utility is enabled in the DPO/DSA oscilloscope's GPIB menu.

Application Directories and Usage

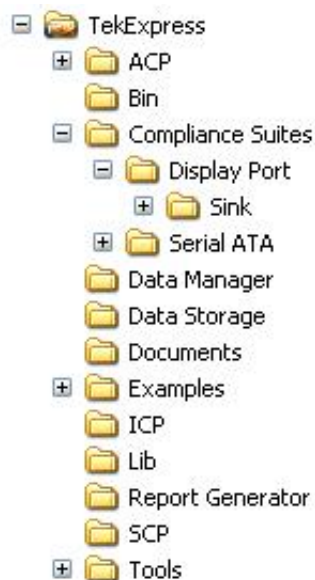
Related Topics

[File Name Extensions](#)

[How To Activate the License](#)

[View Test Related Files](#)

The application directory and associated files are organized as follows:



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

Table 3: Default directory names and their usage

Directory names	Usage
InstallDir\TekExpress	Contains the application and associated files.
\TekExpress\Compliance Suites	Has compliance specific sequence files. The folders under this directory represent the devices to be tested.
\TekExpress\Compliance Suites\DisplayPort\	Includes "Sink" folder.
\TekExpress\Compliance Suites\DisplayPort\Sink	Includes the AUX controller "Available" and "Not Available" folders.
\TekExpress\ACP	Includes instrument and application specific interface libraries of TekExpress.
\TekExpress\SCP	
\TekExpress\ICP	
\TekExpress\Data Manager	Includes the result management specific libraries of TekExpress are present in these folders.
\TekExpress\Data Storage	
\TekExpress\Report Generator	
\TekExpress\Documents	Includes the Method of Implementation documents and technical documentation for the application.

Table 3: Default directory names and their usage (cont.)

Directory names	Usage
\TekExpress\Bin	Includes the Miscellaneous libraries of TekExpress.
\TekExpress\Lib	
\TekExpress\Tools	

File Name Extensions

Related Topics

[Application Directories and Usage](#)

[How To Activate the License](#)

The software uses the following file name extensions:

File name extension	Description
.TekX	The session file will be saved in this format.
.seq	The test sequence file.
.xml	The encrypted XML file that contains the test specific configuration information. The log file extension is also xml.
.PDF	The PDF file that details the method of implementation for the test.

How To Activate the License

Related Topics

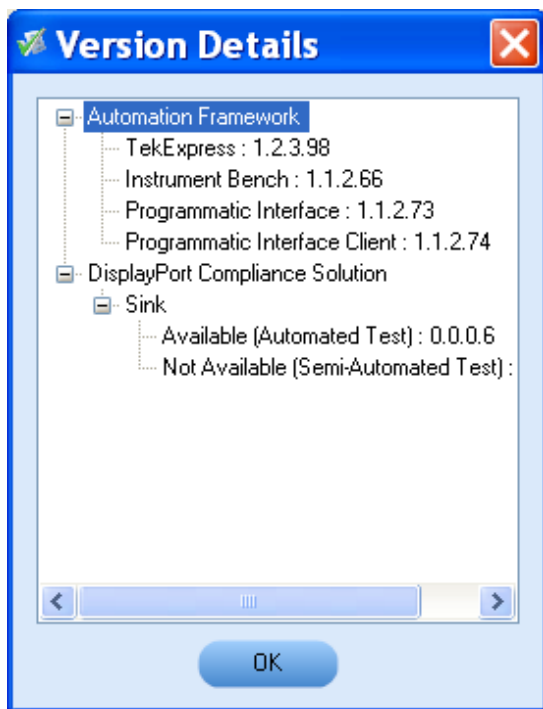
- [Application Directories and Usage](#)
- [File Name Extensions](#)

Follow the steps below to activate the license:

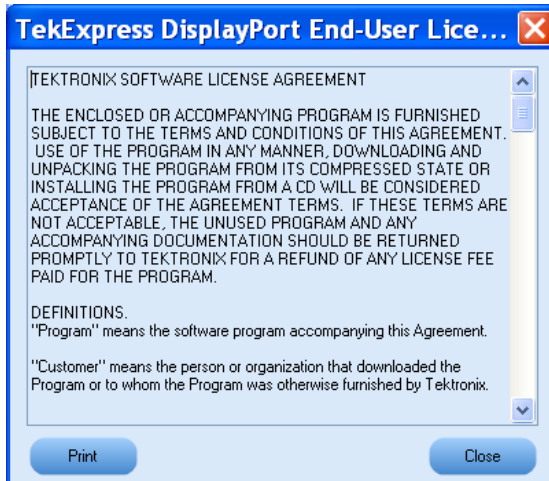
1. Click **Help > About** to view the license information.




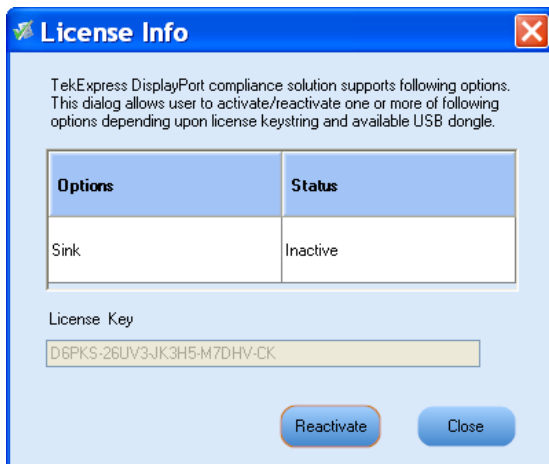
2. Click the **View Version Details** link to check the version numbers of the installed test suites.



3. Click the **View End-User License Agreement** link to open the following Tektronix Software License Agreement window. Click **Print** to print the License Agreement.



4. Click **License Info** to view the available software options. This window shows the license key and the various options with their status (active or inactive) with the current license key.
5. If you are activating the license for the first time, the license key field will be empty. To activate the license, connect the USB dongle to your computer, enter the license key provided in the license key certificate, and click **Activate**. If the activation is successful, a  sign is displayed next to the license key field.



6. If you are reactivating the license, click **Reactivate**, enter the new license key and click **Activate**.

Before You Click Run

After you first launch TekExpress, it creates the following folders on your computer:

- \My Documents\My TekExpress

NOTE. Ensure that the “My TekExpress” folder has read and write access.

NOTE. If a user with a different Windows login ID launches TekExpress, a new My TekExpress folder is created under that user’s My Documents folder

- \My Documents\My TekExpress\DisplayPort.
- \My Documents\My TekExpress\DisplayPort\Untitled Session. Every time the DisplayPort.exe is launched a Untitled Session folder is created under DisplayPort folder. The Untitled Session folder is deleted when you exit TekExpress.



CAUTION. Each session has multiple files associated with it. Do not modify any of the session files and/or folders as this may result in loss of data or corrupted session files.

- The My TekExpress folder is created as a shared folder with share name as <domain><user ID> My TekExpress (or if the PC is not connected to domain then share name is <Computer name><user ID> My TekExpress).
- The above shared folder is mapped as X: (X drive) on to the PC where TekExpress is running.

NOTE. If X drive is mapped to any other shared folder, TekExpress will pop-up a Warning message window asking to disconnect the X: drive manually.

Do the following before you click Run:

NOTE. Ensure that the network connectivity is enabled on the PC running the TekExpress.

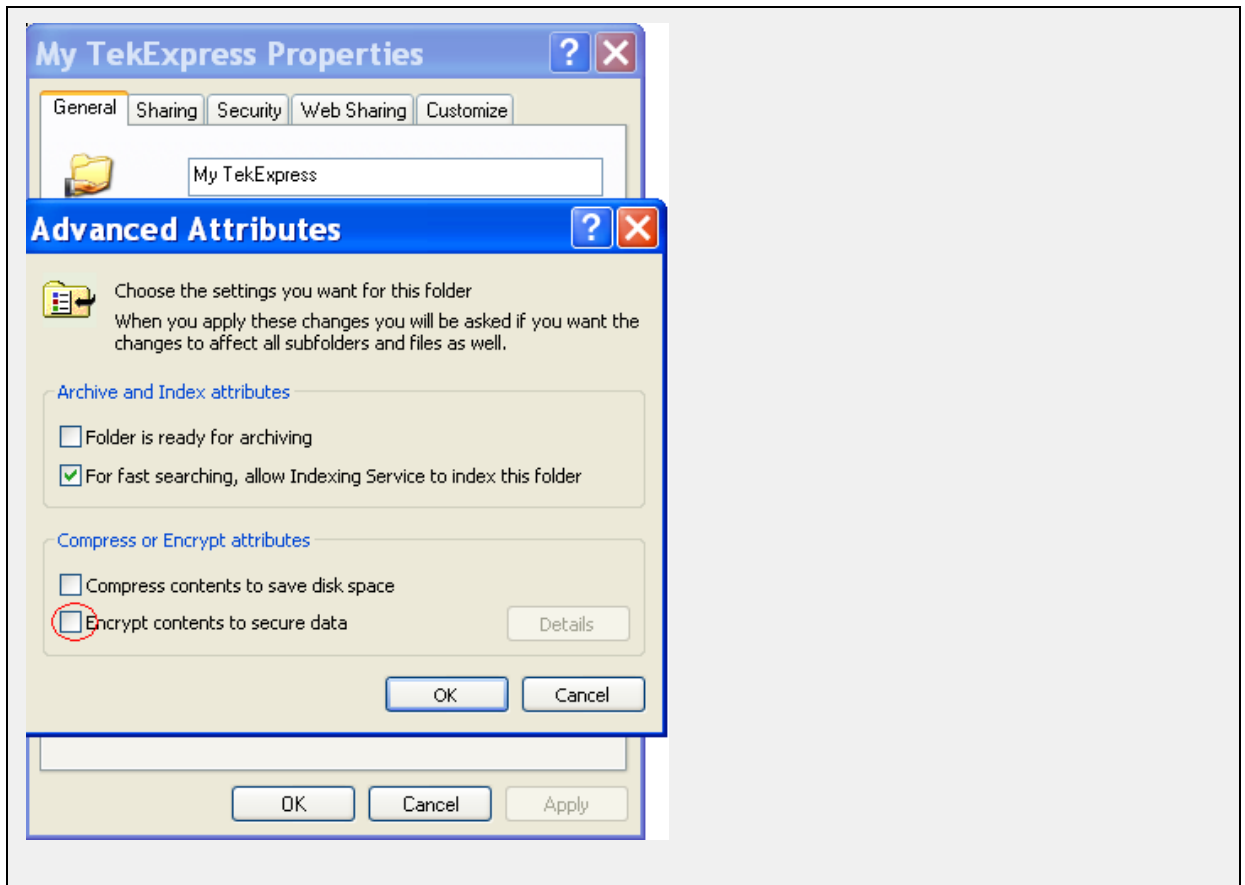
1. [Map](#) the shared My TekExpress folder as X: (X drive) on all the instruments used in test setup running Microsoft Windows Operating System. This share folder is used to save the waveform files or any other file transfer operations.
2. Right click on the My TekExpress folder and open the **Properties** dialog box. Select **General** tab and then **Advanced**. In the **Advanced Attributes** window, ensure that the option **Encrypt contents to secure data** is NOT selected. Click [here](#) to view the picture.

3. Ensure that the DisplayPort pattern file provided with TekExpress DVD are available on the respective instruments. For more details, refer to the `ReadmeFirst.txt` located in the `DisplayPort Setup Files` folder on the TekExpress DVD.

Mapping My TekExpress folder

To map the My TekExpress folder on the instruments, follow the steps below:

1. Open Windows Explorer.
2. From the Windows Explorer menu, select **Tools > Map Network drive**.
3. Select the Drive letter as X: (if there is any previous connection on X:, disconnect it first through **Tools > Disconnect Network drive** menu of Windows Explorer).
4. In the Folder field, enter remote My TekExpress folder path (for example, \\192.158.97.65\John's My TekExpress)
5. You can determine the IP address of the PC where "My TekExpress" folder exists by doing the following:
 - Select **Start > Run** menu on the PC where My TekExpress folder exists.
 - Enter `cmd` and click **Enter**.
 - At command prompt, type `ipconfig`.



TekExpress Application Overview

TekExpress is the Tektronix Compliance Characterization, and Debug Test Automation Framework, developed to support current and future test automation needs of customers. Developed using National Instruments' TestStand, TekExpress leverages on the capabilities of Microsoft .NET framework. It is a highly modular architecture that enables deploying automated test solutions for various serial standards in a relatively short time. TekExpress provides a test automation solution for the DisplayPort CTS 1.1 standards.

Starting the Application

Related Topics

[Resizing the Application Window](#)

[Exiting the Application](#)

The application uses a USB dongle that contains the license key. This dongle must be present on the PC or the instrument hosting the TekExpress application.

The application also checks for a file, called `Resources.xml`, located in My TekExpress folder. If this file is not found, instrument discovery is performed before launching TekExpress. The `Resources.xml` file contains information regarding instruments available on network.

When the application starts, it checks for the appropriate license key. If the valid license key is not present, the application switches to the “Demo” mode. If the application fails to detect the dongle, it continues to run in Demo mode.

To start the application, you can do one of the following:

- Click **Start > Programs > Tektronix > TekExpress > TekExpress DisplayPort**.

- Double click the icon  on the desktop.

- If you have previously saved a session, you can double-click the session file stored under My TekExpress\DisplayPort.

When the application is launched it displays the splash screen providing launch information. The application also checks for the presence and validity of the USB dongle.







NOTE. If the application was not terminated properly during the last use, a dialog box asks to recall the previously unsaved session.

Resizing the Application Window

Related Topics

[Starting the Application](#)

[Exiting the Application](#)

- To minimize the application, click  on the application title bar. To restore the application to its previous size, select  TekExpress Displa... in the Windows task bar.
- To maximize the application, click . To restore it to previous size, click  on the application title bar.


Exiting the Application

Related Topics

[Starting the Application](#)

[Resizing the Application Window](#)

To exit the application, do one of the following:

- Click **File > Exit**.
- Click  on the application title bar.

Global Controls

The menus and controls that appear outside the individual tabs are called “Global Controls”. These are used to specify the devices to be tested.

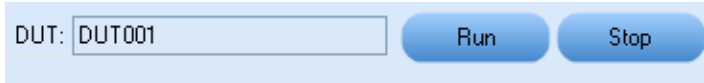



Table 4: Controls and Functions

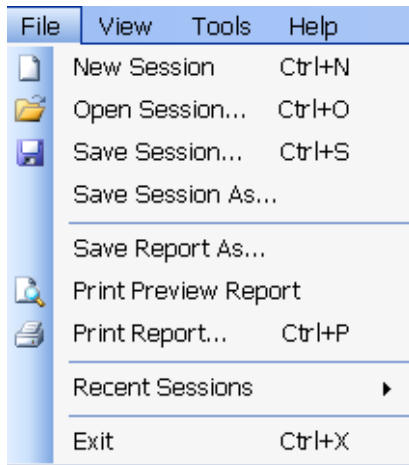
Control name	Function
DUT	The device ID is specified at the global level and the information is stored in the default location for all data files. This field cannot be empty and does not allow these special characters (.,,.,.,.,.,\,/:?"<> *). The maximum length of characters allowed is 32.
	You will be able to run/stop the tests.

File Menu

Related Topics

- [View Menu](#)
- [Tools Menu](#)
- [Help Menu](#)

Click **File** on the application menu bar.



The File menu has the following selections:

Menu	Function
New Session	Starts a default session of TekExpress.
Open Session	Opens a saved session.
Save Session	Saves the session.
Save Session As	Saves a session in a different name.
Save Report As	Saves the report in user specified location.
Print Preview Report	Previews the report before printing.
Print Report	Opens the Windows "Print" dialog box.
Recent Sessions	Lists recent sessions.
Exit	Closes the application.

View Menu

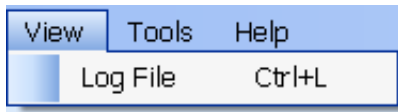
Related Topics

[File Menu](#)

[Tools Menu](#)

[Help Menu](#)

Click **View** on the application menu bar.



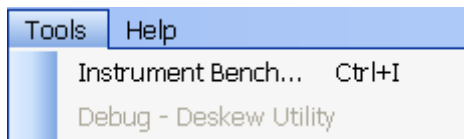
The View menu has the following selections:

Menu	Function
Log File	Opens the log (log.xml) file in the default viewer.

Tools Menu

Related Topics
[File Menu](#)
[View Menu](#)
[Help Menu](#)

Click **Tools** on the application menu bar.



The Tools menu has the following selections:

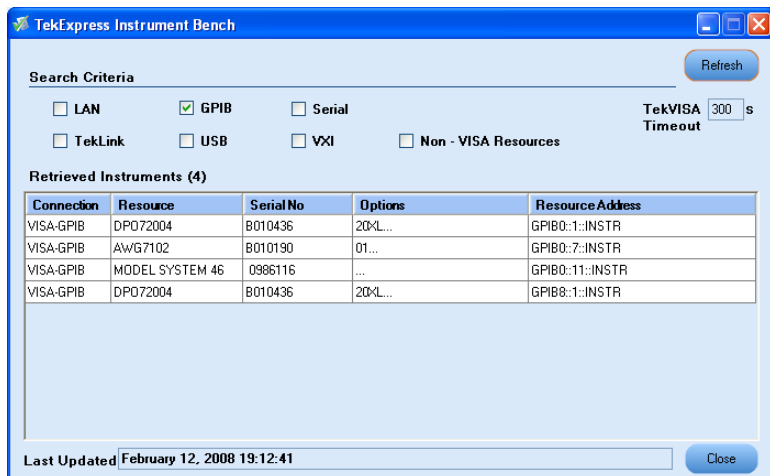
Menu	Function
Instrument Bench	Opens a dialog box showing the list of instruments attached to the test setup.

Tools > Instrument Bench

The Instrument Bench window shows the list of VISA and Non-VISA resources found on different interfaces/connections. It serves two purposes at the launch of TekExpress:

- Discovers the connected instruments.
- Confirms the instrument connection setup.

When you click **Tools > Instrument Bench**, the following dialog box is displayed:



- **Search Criteria:** The various connections on which you can search. **Non-VISA Resources** are the instruments that cannot be searched using TekVISA.
- **Retrieved Instruments:** Displays the count and details of instruments that were discovered.
- **Last Updated:** Displays the time when the last time search was performed.
- **TekVISA Refresh Timeout (Seconds):** This time out specifies the maximum time that TekExpress can wait for TekVISA update.

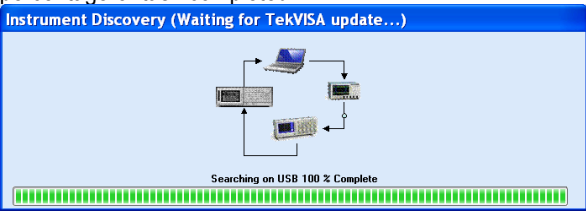
NOTE. TekExpress uses TekVISA for instrument search. Ensure that TekVISA is running on your system before you refresh the instrument bench window.

Table 5: Retrieved Resources properties in the Instrument Bench window

Title	Description
Connection	Shows the type of connection with the instrument.
Resource	Shows the name of the resource.
Serial Number	Shows the serial number of the resource.
Options	Shows the options available on the instrument. ¹
Resource Address	Shows IP Address/Port number of the resource.

¹ The option column displays the options that fit in the field. To view complete options on the instrument, move the mouse cursor over the option.

Table 6: Button controls on Instrument Bench dialog box

Button	Function
Refresh	The application searches on the selected connection for resources. While searching resources it shows the Instrument Bench discovery window. The Discovery window shows the connection currently being scanned and the percentage of task completed.
	
Close	Closes the dialog box.

Help Menu

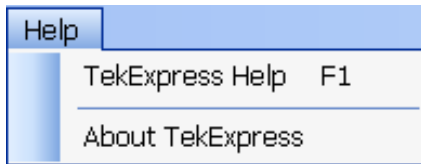
Related Topics

[File Menu](#)

[View Menu](#)

[Tools Menu](#)

Click **Help** on the application menu bar.



The Help menu has the following selections:

Selection	Description or Function
TekExpress Help	Displays TekExpress Help (F1).
About TekExpress...	Displays application details such as software name, version number and copyright.

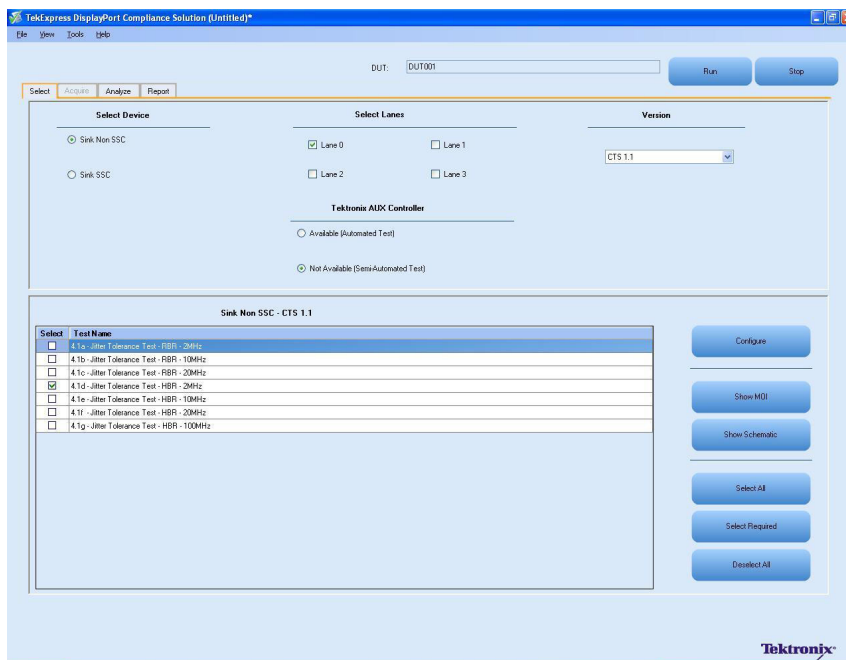
Select the Test(s)

Related Topics

- [View and Select Connected Instruments](#)
- [Configure and Run the Tests](#)
- [View the Progress of Analysis](#)
- [View the Report](#)
- [View Test Related Files](#)

The application tests DisplayPort Sink devices to ensure that the device passes the DisplayPort CTS Jitter Tolerance test.

The Select panel allows you to select tests to configure and run.



This panel provides the following functions:

Select Device

Select the Device type. And the test suite options will be automatically updated corresponding to the device selected.

Select Lanes

Select the Lane number(s) that will be tested.

Select Test Suite

The application allows you to select a subset of tests to execute. Based on the test suite selected, the Version drop-down list will be populated.







Version

You can select the appropriate version. For example, CTS 1.1.

NOTE. *If any of the check boxes in the Select column is grayed, you cannot make any changes. It implies that the test is mandatory.*

Once you select a row, the following options are available:

Table 7: Button controls on the Select panel

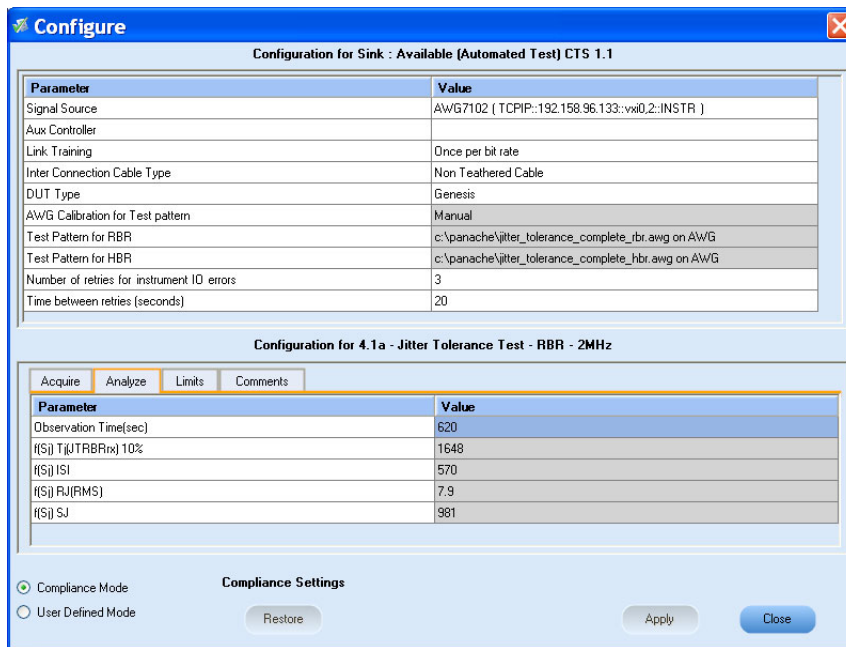
Button	Description
	Opens the configuration panel for the selected test.
	Opens the PDF of method of implementation (MOI) for the selected test.
	Opens the schematic for the selected test. This is useful if you want to verify the test setup before running the test.
	Selects all tests in the table.
	Selects all the DisplayPort required tests in the grid and deselects all informative tests in the table.
	Deselects all tests in the table.

Configure and Run the Test(s)

Related Topics

- [Select the Tests](#)
- [View and Select Connected Instruments](#)
- [View the Progress of Analysis](#)
- [View the Report](#)
- [View Test Related Files](#)

The configuration panel is used to create, view, and edit the parameters associated with the acquisition and the analysis of the selected test.



You have the following options:

- To choose between running the tests in a Compliance or User Defined mode.
- To restore compliance mode values.
- To change the parameters associated with the configuration of acquisition.
- To change the parameters associated with analysis configuration.

The upper half of the Configure panel has general parameters that are common for all the tests under the selected test suite that are editable. The lower half of the Configure panel has test specific parameters.

NOTE. If any of the test parameters are grayed, it means that these parameters cannot be modified in the compliance mode. When you switch to the user-defined mode, these parameters are editable.

Table 8: Test parameters

Parameters to configure

Analyze parameters

Parameter	Value
(S) Tj(JTRBRin) 10%	1648
(S) ISI	570
(S) RJ(RMS)	7.9
(S) SJ	981
(S) Test Time(Sec)	620

Description

Shows the various parameters related to analysis of a selected test. These parameters can vary from one test to another such as, Jitter values.

Test Limits

Details	Value1	Compare String	Value2
Jitter Frequency	1000	LE (<=)	0

Applies to a specific test. It shows the maximum number of bit errors for the test.

Comments

Enter test
Enter more test!

You can specify a comment up to 256 characters long for the selected test. The comments will be printed on the report.

Compliance settings



Restores the compliance settings.



Accepts all changes that you made.



Dismisses the dialog box and does not apply changes.

Click **Run** in the Select panel to run the selected tests.

Refer to the following table for different test limit comparisons:

Table 9: Different test limit comparisons

Comparison string	Description
EQ(=)	Equal to
NE(!=)	Not equal to

Table 9: Different test limit comparisons (cont.)

Comparison string	Description
GT(>)	Greater than
LT(<)	Less than
GE(>=)	Greater than or Equal to
LE(<=)	Less than or Equal to
GTLT(><)	Greater than and Less than
GELT(>=<)	Greater than or equal to and Less than
GTLE(><=)	Greater than and Less or equal to
LTGT(<>)	Less than and Greater than
LEGE(<= >=)	Less than or equal to and Greater than or equal to
LEGT(<= >)	Less than or equal to and Greater than
LTGE(< >=)	Less than and Greater than or equal to
GELE(>= =<)	Greater than or equal to and Less than or equal to

View and Select Connected Instruments

Related Topics

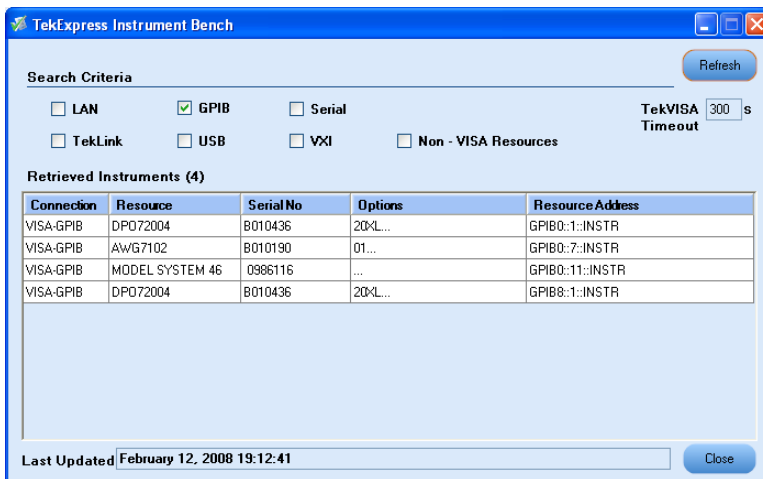
- [Select the Tests](#)
- [Configure and Run the Tests](#)
- [View Test Related Files](#)
- [View the Progress of Analysis](#)
- [View the Report](#)

Viewing Connected Instruments

The **Tools > Instrument Bench** menu item is used to discover connected instruments required for the tests. The application uses TekVISA to discover the connected instruments. Once the operation is done, the Instrument Bench dialog box resumes operation and lists the instrument-related details based on the selected search criteria.

NOTE. When the TekVISA Instrument Manager checks for connected instruments, the Instrument Bench dialog box is unresponsive.

For example, if you select LAN as the search criteria in the Instrument Bench dialog box and click Refresh, the TekVISA Instrument Manager checks for the instruments availability over LAN and the details of the instrument are displayed under **Retrieved Instruments** table.



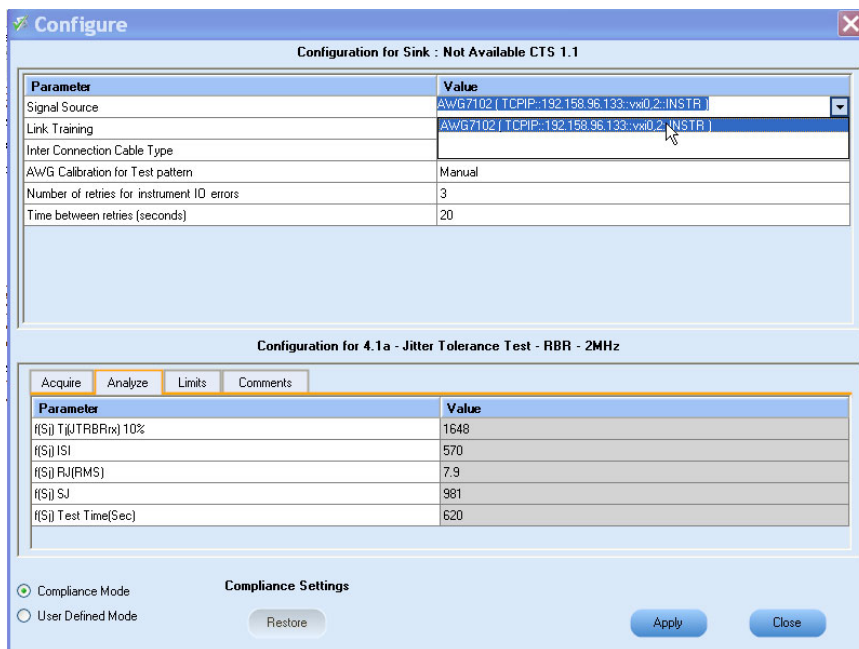
You can provide the time in the **TekVISA Timeout (Seconds)** field, within which if the TekVISA Instrument Manager does not find the instruments, the TekExpress application resumes operation.

If you choose Non-VISA resources, all the instruments supported by TekExpress but not communicating over the VISA layer can be searched.

Selecting Connected Instruments

You can view the instruments connected in the Configuration panel. The upper half of the panel displays the general parameters for the tests under the selected test suite.

You can choose the instruments from the drop-down list as shown in the following figure:



NOTE. The list of instruments displayed is specific to the selected test suite. It does not show all the connected instruments.

View the Progress of Analysis

Related Topics

[Select the Tests](#)

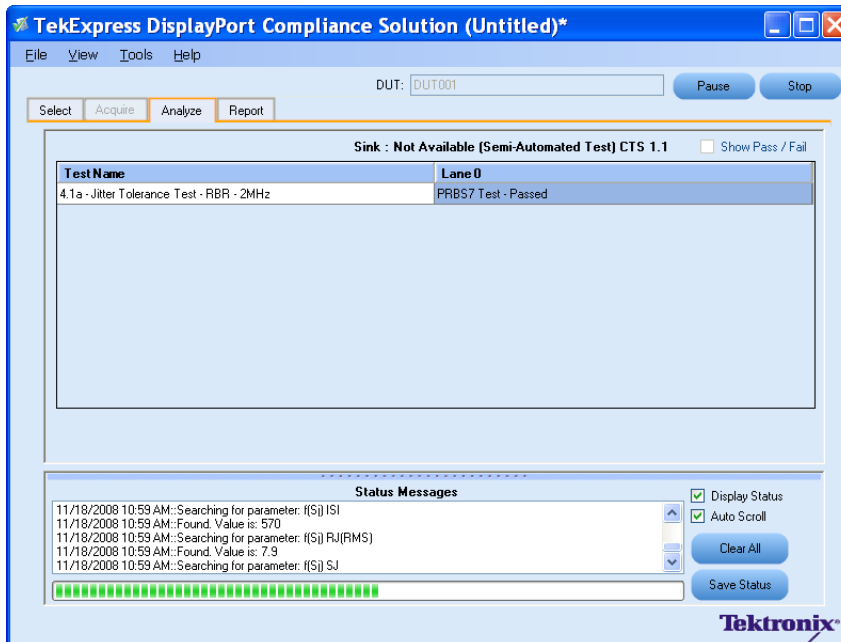
[View and Select Connected Instruments](#)

[Configure and Run the Tests](#)

[View the Report](#)

[View Test Related Files](#)

You can view the progress of the analysis in the Analyze panel. When the analysis is complete, the result value of each test is updated.



Analysis Table

The table contains the following:

- The test name.
- The status of the tests that are being run.

The Tests that are not yet started are shown with a “To be Started” status. A summarized status of the currently running test is shown on the status.

The **Status Messages** window timestamps all runtime messages and displays them. You can do the following:

- **Display Status:** Enable/Disable status messages.
- **Auto Scroll:** The status messages are scrolled automatically.
- **Clear All:** Clear all status messages in Status Window.

- **Save Status:** Save all status messages in text file. Displays a standard save file window and saves the status messages in the user specified file.

NOTE. *The Status Messages window is dockable and can be resized.*

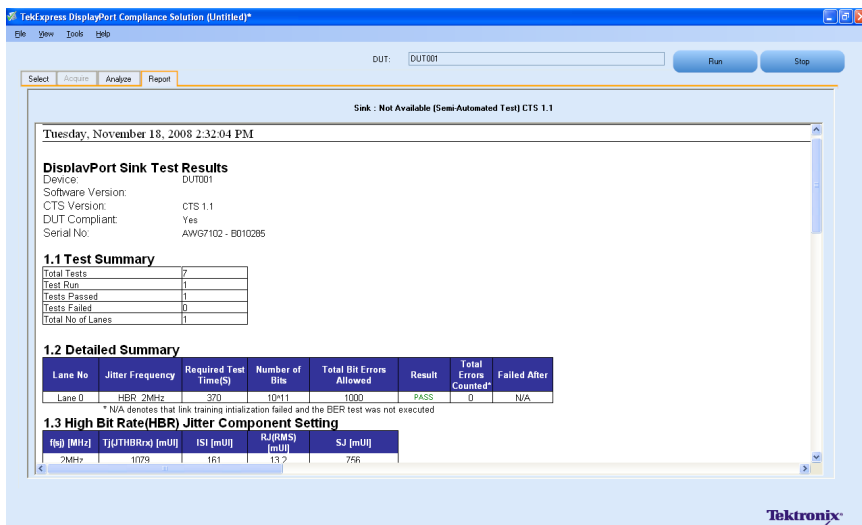
View the Report

Related Topics

- [Select the Tests](#)
- [View and Select Connected Instruments](#)
- [Configure and Run the Tests](#)
- [View the Progress of Analysis](#)
- [View Test Related Files](#)

After the analysis, a report is automatically generated and displayed in the report panel. The report shows the results of the tests, including device information and pass/fail status of each test.

The Report View Area contains an HTML version of the report template. You can select any area of the report and copy it to the clipboard to make it available to other applications.



NOTE. You need to install Microsoft Excel 2002 before using the "View Scorecard" option.

View Test Related Files

Related Topics

[Application Directories and Usage](#)

All the test related files for currently selected tests are always saved under My Documents\My TekExpress\DisplayPort\Untitled Session.

When you save a session, it is saved with the session name under the path My Documents\My TekExpress\DisplayPort\SessionName for future references.

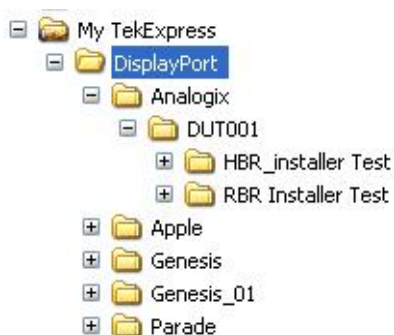
The session that is currently running will be stored in the same path as “Untitled” until you save it.



WARNING. Do not save Sessions in the name “Untitled” and “Backup” as they are application specific files and will be deleted when the application exits.

A session folder can contain results for more than one DUT, and a DUT folder can contain more than one run data folder marked by date-time stamp as folder name.

Below is an example image of data storage:



Generate Patterns

For details on DisplayPort pattern creation, refer to the *DisplayPort Standard Tektronix Method Of Implementation for Sink Tests* document. Also, you can open the document by clicking



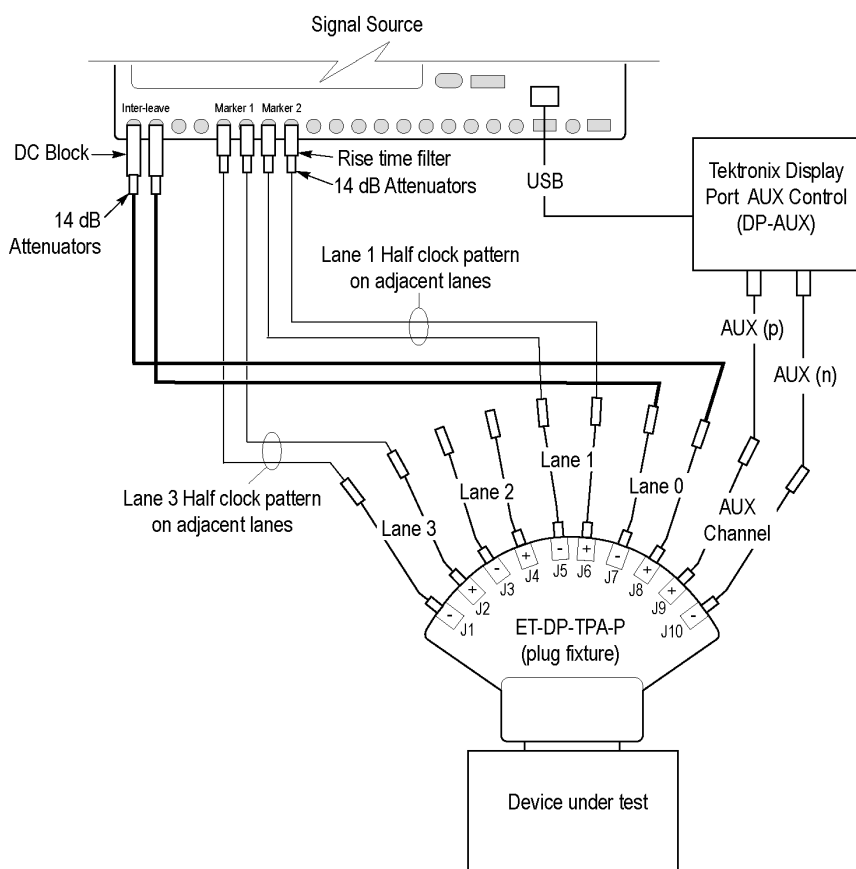
option in the Select Panel.

Jitter Tolerance Test for Lane 0: Equipment Setup

You need the following equipment to set up the application:

Resource	Model supported
High Speed Signal Source	Tektronix AWG7102 (Options 01, 06)
Real Time Oscilloscope	Tektronix DPO/DSA 72004, DPO/DSA 71604, DPO/DSA 71254, TDS6154C, and TDS6124C
Test Fixtures	TPA-P and TPA-R fixtures from Efficere Technologies
Attenuators	Tek P/N: 015-1002-01 (14dB) – 6 numbers. Tek P/N: 015-1001-01 (6dB) – 4 numbers.
DC Block - Picosecond Pulse Lab	5501A – 2 (for Analog output)

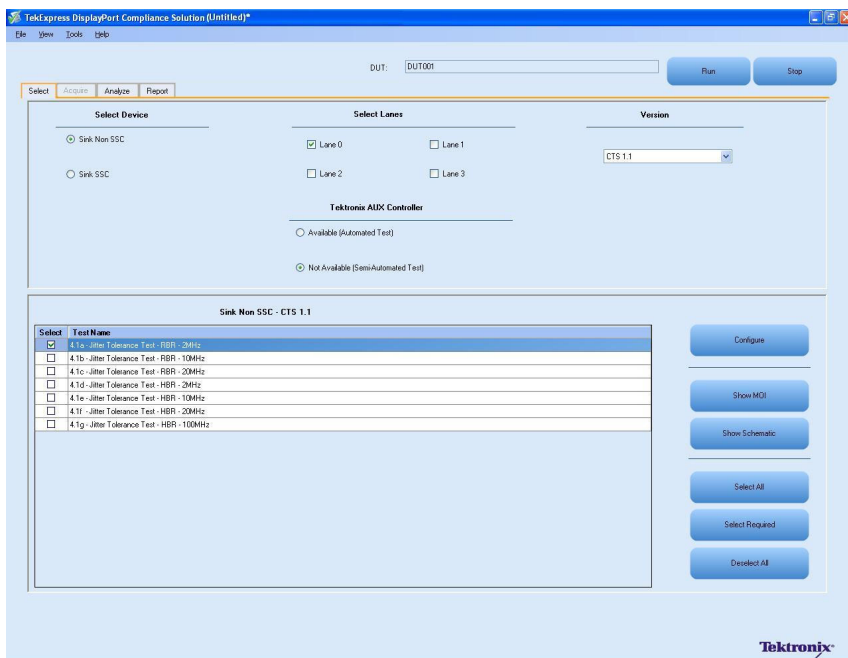
Connect the equipment as shown in the following diagram:



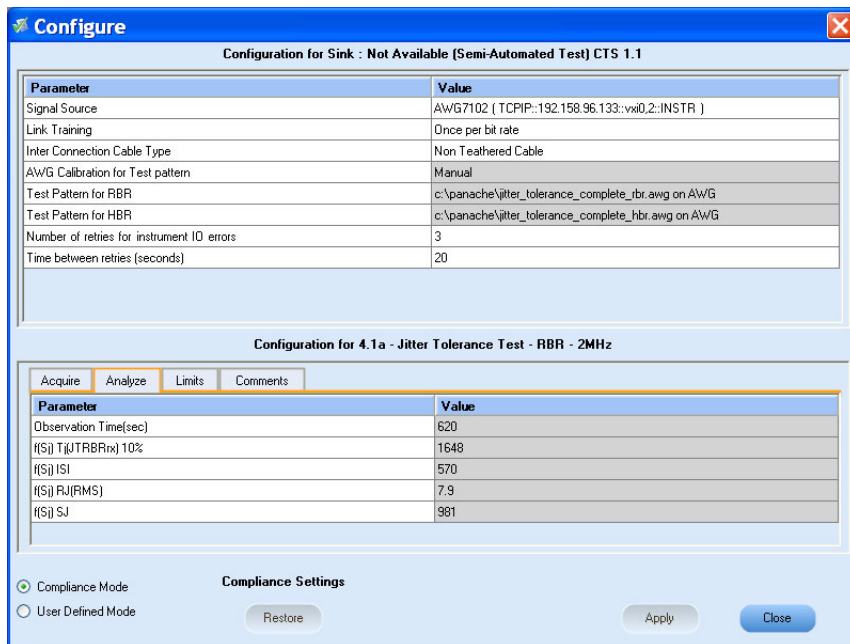
Jitter Tolerance Test for RBR in Semi-Automated mode

To run a Sink Jitter Tolerance test, follow these steps:

1. Select **Sink** as the device type.
2. Select **Lane 0** as the lane to be tested.
3. Select Tektronix AUX Controller **Not Available (Semi-Automated Test)** option and CTS 1.1 as the version.
4. Enter the DUT name in the DUT field.
5. If you want to verify the test setup before running the test(s), click **Show Schematic**.
6. Select **4.1a - Jitter Tolerance Test - RBR - 2MHz** option.



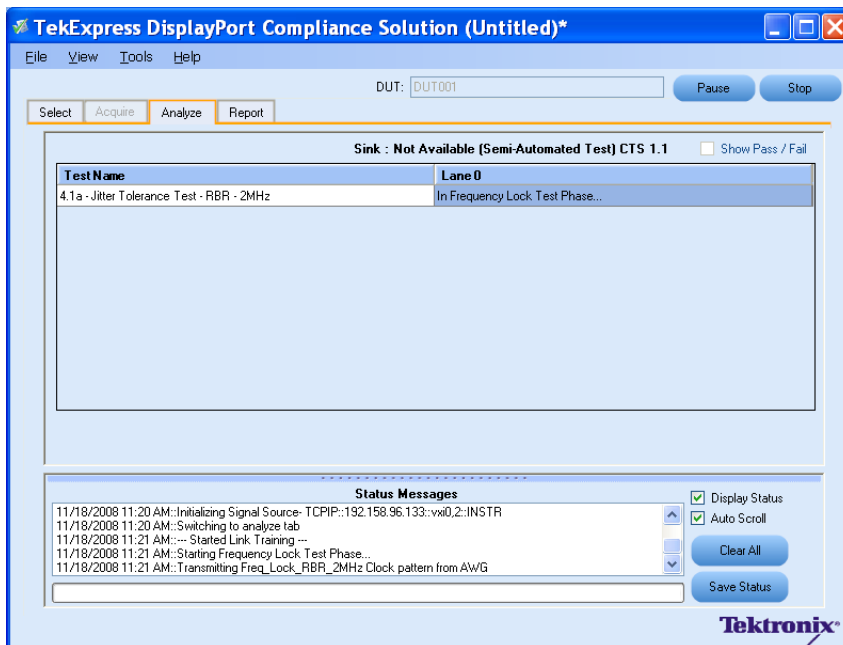
7. Click **Configure** to configure the test parameters. Observe that the default settings are in the Compliance mode.



8. If you want to change the parameters, choose **User Defined Mode**. The message reports that the changes made to a test may no longer be compliant.
9. You can configure any test to help you analyze measurement results. To refer to the *DisplayPort Standard Tektronix MOI for Sink Tests* document for information on how to manually configure the Jitter Tolerance tests, click **Show MOI** in the Select panel.
10. Click **Apply** to apply the new settings for the selected test. If you want to restore the default settings, click **Restore**. To close the dialog box, click **Close**.

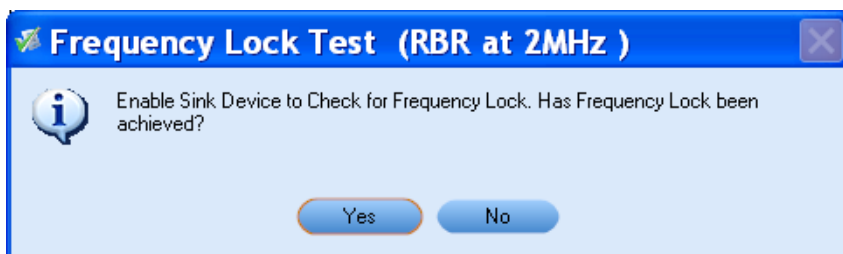
11. Click **Run** to run the selected tests.

The status of the tests is displayed in the Analyze panel.

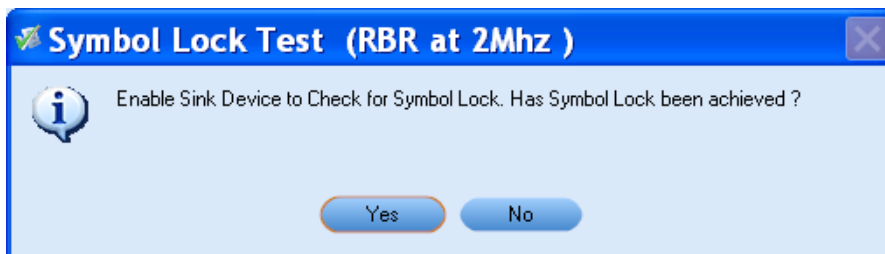


12. The Testing is done in two phases - Frequency lock phase and symbol lock phase.

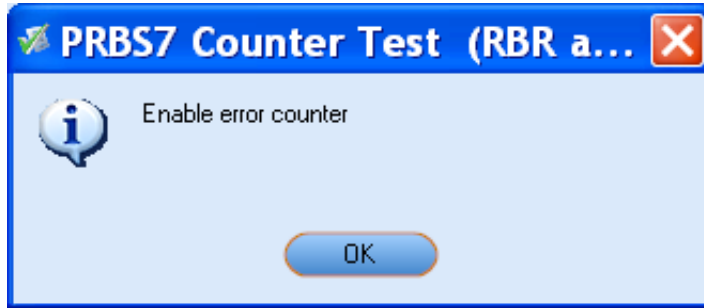
If the Tektronix AUX Controller is not available, a dialog box notifies whether to enable the sink device for frequency lock. Click **Yes** and continue.



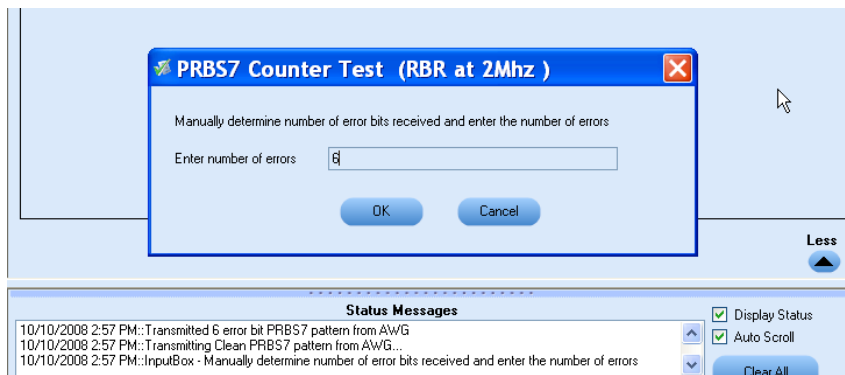
13. If the Tektronix AUX Controller is not available, a dialog box notifies whether to enable the sink device for symbol lock. Click **Yes** and continue.



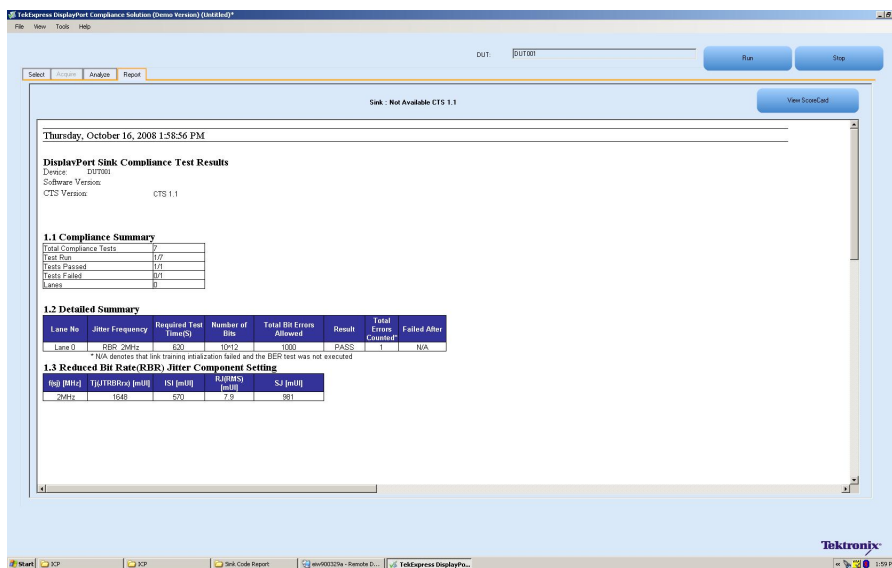
14. Click **OK** to enable the error counter.



15. Enter the number of transmitted error bits in the following dialog box.



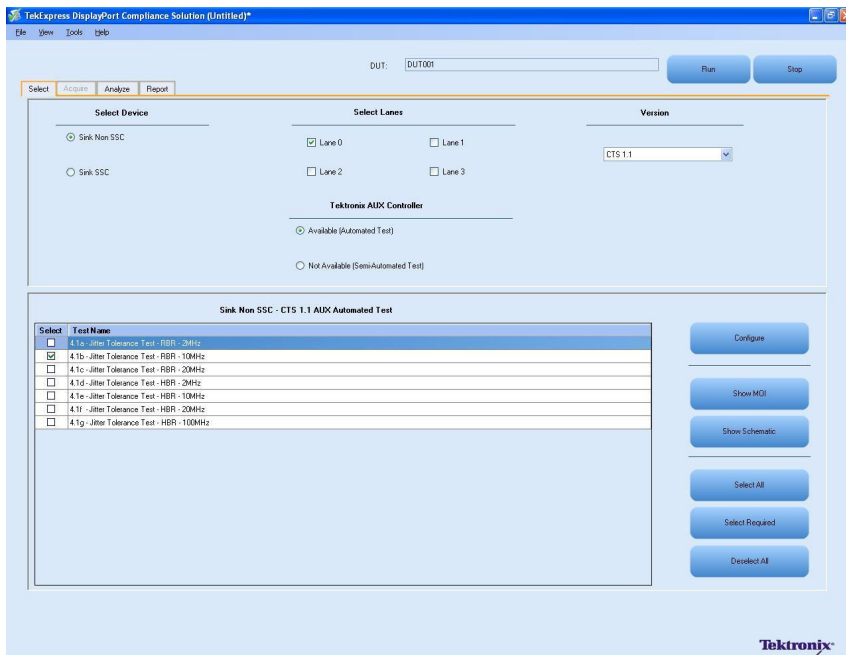
16. After the tests run successfully, a report is generated and displayed in the Report panel.



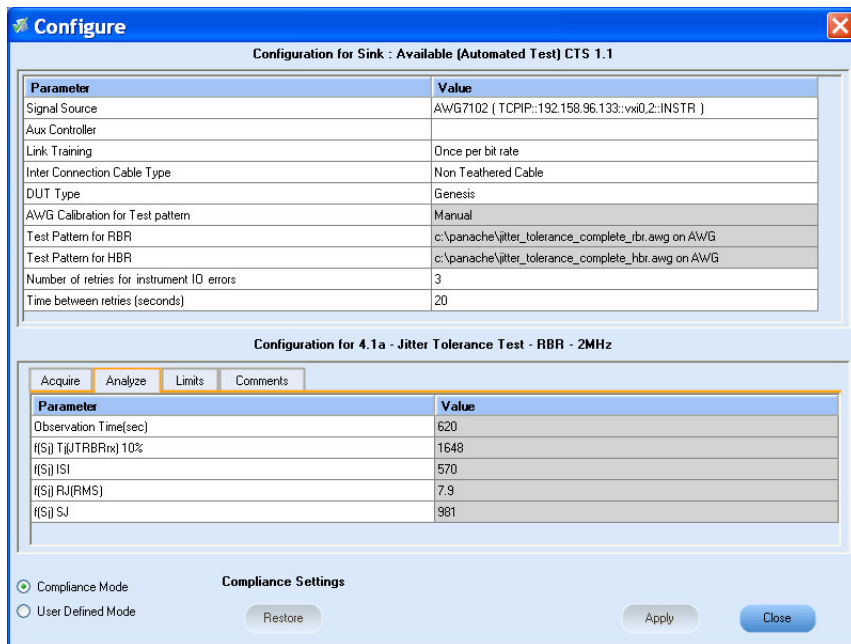
You can save the report using **File > Save Report As** option.

Jitter Tolerance Test for RBR in Automated Mode

1. Select **Sink** as the device type.
2. Select **Lane 0** as the lane to be tested.
3. Select Tektronix AUX Controller **Available (Automated Test)** option.
4. Enter the DUT name in the DUT field.
5. If you want to verify the test setup before running the test(s), click **Show Schematic**.
6. Select **4.1b - Jitter Tolerance Test - RBR - 10MHz** option.



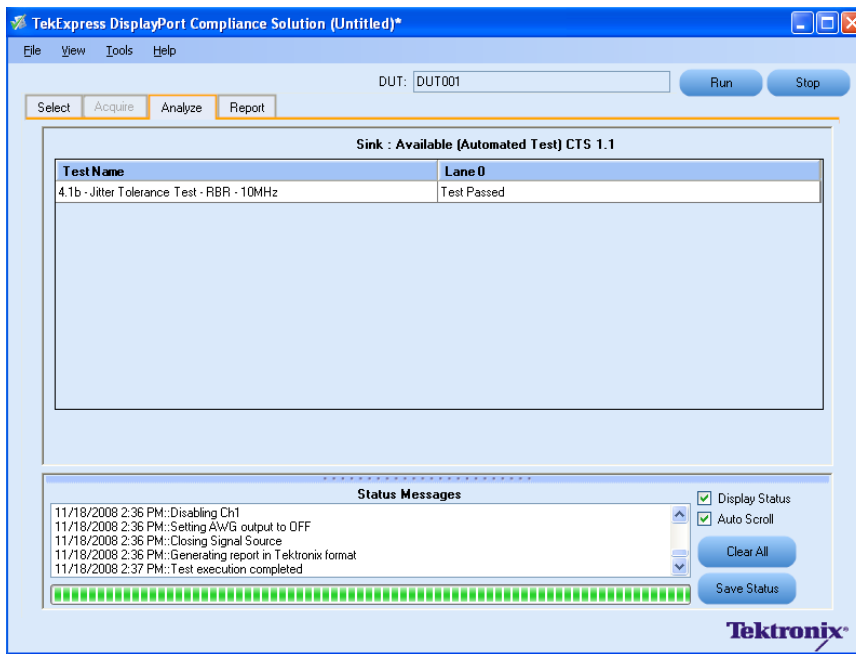
7. Click **Configure** to configure the test parameters. Observe that the default settings are in Compliance mode.



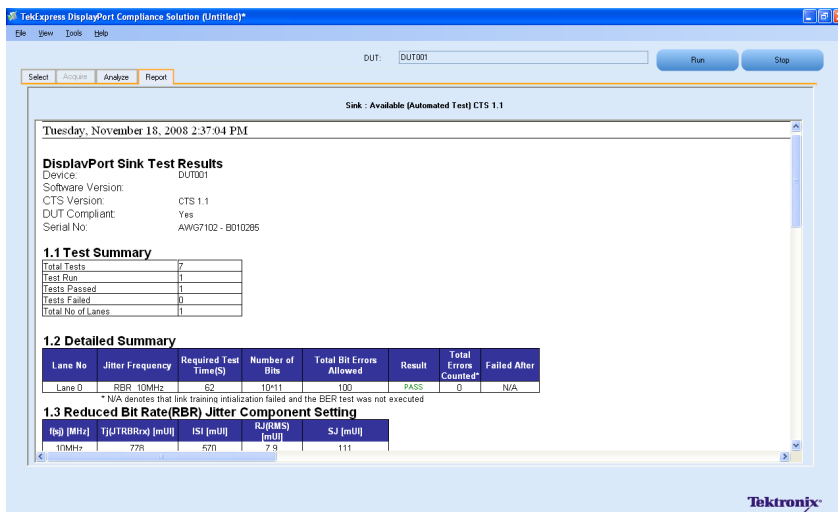
8. If you want to change the parameters, choose **User Defined Mode**. The message reports that the changes made to a test may no longer be compliant.
9. You can configure any test to help you analyze measurement results. To refer to the *DisplayPort Standard Tektronix MOI for Sink Tests* document for information on how to configure the sink test, click **Show MOI** in the Select panel.
10. Click **Apply** to apply the new settings for the selected test. If you want to restore the default settings, click **Restore**. To close the dialog box, click **Close**.

11. Click **Run** to run the selected tests.

The status of the tests is displayed in the Analyze panel.



12. After the tests run successfully, a report is generated and displayed in the Report panel.



Pattern Sequence

TekExpress Display Port Software needs to have the following sequencing of patterns to run compliance automated test. The nomenclature of the patterns should be exactly same as shown in the sequence.

If you are using an AWG7102, click on the links below to see the file names and the sequence they should follow:

HBR SSC

File name should be **JT_SSC_HBR_7102 . awg**.

Sequence:

1. Freq_Lock_HBR_2MHz
2. Symbol_Lock_HBR_2MHz
3. PRBS7_HBR_Clean
4. PRBS7_128times_1bit_errors
5. PRBS7_HBR_Clean
6. PRBS7_HBR_2MHz
7. PRBS7_HBR_Clean
8. Freq_Lock_HBR_10MHz
9. Symbol_Lock_HBR_10MHz
10. PRBS7_HBR_Clean
11. PRBS7_128times_1bit_errors
12. PRBS7_HBR_Clean
13. PRBS7_HBR_10MHz
14. PRBS7_HBR_Clean
15. Freq_Lock_HBR_20MHz
16. Symbol_Lock_HBR_20MHz
17. PRBS7_HBR_Clean
18. PRBS7_128times_1bit_errors
19. PRBS7_HBR_Clean
20. PRBS7_HBR_20MHz
21. PRBS7_HBR_Clean
22. Freq_Lock_HBR_100MHz

23.Symbol_Lock_HBR_100MHz

24.PRBS7_HBR_Clean

25.PRBS7_128times_1bit_errors

26.PRBS7_HBR_Clean

27.PRBS7_HBR_100MHz

28.PRBS7_HBR_Clean

RBR SSC

File name should be **JT_SSC_RBR_7102 . awg**.

Sequence:

1. Freq_Lock_RBR_2MHz

2. Symbol_Lock_RBR_2MHz

3. PRBS7_RBR_Clean

4. PRBS7_128times_1bit_errors

5. PRBS7_RBR_Clean

6. PRBS7_RBR_2MHz

7. PRBS7_RBR_Clean

8. Freq_Lock_RBR_10MHz

9. Symbol_Lock_RBR_10MHz

10.PRBS7_RBR_Clean

11.PRBS7_128times_1bit_errors

12.PRBS7_RBR_Clean

13.PRBS7_RBR_10MHz

14.PRBS7_RBR_Clean

15.Freq_Lock_RBR_20MHz

16.Symbol_Lock_RBR_20MHz

17.PRBS7_RBR_Clean

18.PRBS7_128times_1bit_errors

19.PRBS7_RBR_Clean

20.PRBS7_RBR_20MHz

21.PRBS7_RBR_Clean

HBR Non-SSC

File name should be **JT_Non SSC_HBR_7102.awg**.

Sequence:

1. Freq_Lock_HBR_2MHz
2. Symbol_Lock_HBR_2MHz
3. PRBS7_HBR_Clean
4. PRBS7_128times_1bit_errors
5. PRBS7_HBR_Clean
6. PRBS7_HBR_2MHz
7. PRBS7_HBR_Clean
8. Freq_Lock_HBR_10MHz
9. Symbol_Lock_HBR_10MHz
10. PRBS7_HBR_Clean
11. PRBS7_128times_1bit_errors
12. PRBS7_HBR_Clean
13. PRBS7_HBR_10MHz
14. PRBS7_HBR_Clean
15. Freq_Lock_HBR_20MHz
16. Symbol_Lock_HBR_20MHz
17. PRBS7_HBR_Clean
18. PRBS7_128times_1bit_errors
19. PRBS7_HBR_Clean
20. PRBS7_HBR_20MHz
21. PRBS7_HBR_Clean
22. Freq_Lock_HBR_100MHz
23. Symbol_Lock_HBR_100MHz
24. PRBS7_HBR_Clean
25. PRBS7_128times_1bit_errors
26. PRBS7_HBR_Clean
27. PRBS7_HBR_100MHz

28.PRBS7_HBR_Clean**RBR Non-SSC**

File name should be **JT_Non SSC_RBR_7102 .awg**.

Sequence:

1. Freq_Lock_RBR_2MHz
2. Symbol_Lock_RBR_2MHz
3. PRBS7_RBR_Clean
4. PRBS7_128times_1bit_errors
5. PRBS7_RBR_Clean
6. PRBS7_RBR_2MHz
7. PRBS7_RBR_Clean
8. Freq_Lock_RBR_10MHz
9. Symbol_Lock_RBR_10MHz
- 10.PRBS7_RBR_Clean
- 11.PRBS7_128times_1bit_errors
- 12.PRBS7_RBR_Clean
- 13.PRBS7_RBR_10MHz
- 14.PRBS7_RBR_Clean
- 15.Freq_Lock_RBR_20MHz
- 16.Symbol_Lock_RBR_20MHz
- 17.PRBS7_RBR_Clean
- 18.PRBS7_128times_1bit_errors
- 19.PRBS7_RBR_Clean
- 20.PRBS7_RBR_20MHz
- 21.PRBS7_RBR_Clean

If you are using an AWG7122, click on the links below to see the file names and the sequence they should follow:

HBR SSC

File name should be **JT_SSC_HBR_7122 .awg**.

Sequence:

1. Freq_Lock_HBR_2MHz
2. Symbol_Lock_HBR_2MHz
3. PRBS7_HBR_Clean
4. PRBS7_128times_1bit_errors
5. PRBS7_HBR_Clean
6. PRBS7_HBR_2MHz
7. PRBS7_HBR_Clean
8. Freq_Lock_HBR_10MHz
9. Symbol_Lock_HBR_10MHz
10. PRBS7_HBR_Clean
11. PRBS7_128times_1bit_errors
12. PRBS7_HBR_Clean
13. PRBS7_HBR_10MHz
14. PRBS7_HBR_Clean
15. Freq_Lock_HBR_20MHz
16. Symbol_Lock_HBR_20MHz
17. PRBS7_HBR_Clean
18. PRBS7_128times_1bit_errors
19. PRBS7_HBR_Clean
20. PRBS7_HBR_20MHz
21. PRBS7_HBR_Clean
22. Freq_Lock_HBR_100MHz
23. Symbol_Lock_HBR_100MHz
24. PRBS7_HBR_Clean
25. PRBS7_128times_1bit_errors
26. PRBS7_HBR_Clean
27. PRBS7_HBR_100MHz
28. PRBS7_HBR_Clean

RBR SSC

File name should be **JT_SSC_RBR_7122 . awg**.

Sequence:

1. Freq_Lock_RBR_2MHz
2. Symbol_Lock_RBR_2MHz
3. PRBS7_RBR_Clean
4. PRBS7_128times_1bit_errors
5. PRBS7_RBR_Clean
6. PRBS7_RBR_2MHz
7. PRBS7_RBR_Clean
8. Freq_Lock_RBR_10MHz
9. Symbol_Lock_RBR_10MHz
10. PRBS7_RBR_Clean
11. PRBS7_128times_1bit_errors
12. PRBS7_RBR_Clean
13. PRBS7_RBR_10MHz
14. PRBS7_RBR_Clean
15. Freq_Lock_RBR_20MHz
16. Symbol_Lock_RBR_20MHz
17. PRBS7_RBR_Clean
18. PRBS7_128times_1bit_errors
19. PRBS7_RBR_Clean
20. PRBS7_RBR_20MHz
21. PRBS7_RBR_Clean

HBR Non-SSC

File name should be **JT_Non SSC_HBR_7122 .awg**.

Sequence:

1. Freq_Lock_HBR_2MHz
2. Symbol_Lock_HBR_2MHz
3. PRBS7_HBR_Clean
4. PRBS7_128times_1bit_errors
5. PRBS7_HBR_Clean

6. PRBS7_HBR_2MHz
7. PRBS7_HBR_Clean
8. Freq_Lock_HBR_10MHz
9. Symbol_Lock_HBR_10MHz
10. PRBS7_HBR_Clean
11. PRBS7_128times_1bit_errors
12. PRBS7_HBR_Clean
13. PRBS7_HBR_10MHz
14. PRBS7_HBR_Clean
15. Freq_Lock_HBR_20MHz
16. Symbol_Lock_HBR_20MHz
17. PRBS7_HBR_Clean
18. PRBS7_128times_1bit_errors
19. PRBS7_HBR_Clean
20. PRBS7_HBR_20MHz
21. PRBS7_HBR_Clean
22. Freq_Lock_HBR_100MHz
23. Symbol_Lock_HBR_100MHz
24. PRBS7_HBR_Clean
25. PRBS7_128times_1bit_errors
26. PRBS7_HBR_Clean
27. PRBS7_HBR_100MHz
28. PRBS7_HBR_Clean

RBR Non-SSC

File name should be **JT_Non SSC_RBR_7122.awg**.

Sequence:

1. Freq_Lock_RBR_2MHz
2. Symbol_Lock_RBR_2MHz
3. PRBS7_RBR_Clean
4. PRBS7_128times_1bit_errors

5. PRBS7_RBR_Clean
6. PRBS7_RBR_2MHz
7. PRBS7_RBR_Clean
8. Freq_Lock_RBR_10MHz
9. Symbol_Lock_RBR_10MHz
10. PRBS7_RBR_Clean
11. PRBS7_128times_1bit_errors
12. PRBS7_RBR_Clean
13. PRBS7_RBR_10MHz
14. PRBS7_RBR_Clean
15. Freq_Lock_RBR_20MHz
16. Symbol_Lock_RBR_20MHz
17. PRBS7_RBR_Clean
18. PRBS7_128times_1bit_errors
19. PRBS7_RBR_Clean
20. PRBS7_RBR_20MHz
21. PRBS7_RBR_Clean

About Programmatic Interface

Related Topics

[Server and Client Proxy Objects](#)

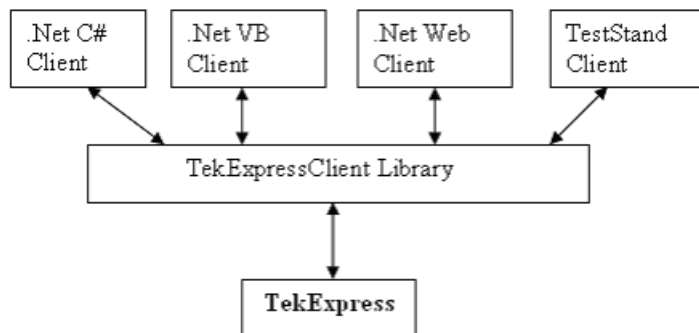
The Programmatic interface allows you to seamlessly integrate the TekExpress test automation application with the high-level automation layer. This also allows you to control the state of TekExpress application running on a local or a remote PC. Following operations can be performed using the programmatic interface exposed by TekExpress:

- Query DUT ID
- Set DUT ID
- SaveSession
- RecallSession
- Run the TekExpress execution
- Stop the TekExpress execution
- Query execution status
- Transfer result files

For simplifying the descriptions, the following terminologies are used in this section:

- **TekExpress Client:** A High level automation application that communicates with TekExpress using TekExpress Programmatic Interface.
- **TekExpress Server:** The TekExpress application when being controlled by TekExpress Client.

TekExpress leverages .Net Marshalling to enable the Programmatic Interface for TekExpress Client. TekExpress provides a client library for TekExpress clients to use the programmatic interface. The TekExpress client library is inherited from .Net MarshalByRef class to provide the proxy object for the clients. The TekExpress client library maintains a reference to the TekExpress Server and this reference allows the client to control the server state.



Click on the following links to get details on them:

What does one need to have to develop TekExpress Client ?

While developing TekExpress Client one needs to use the TekExpressClient.dll. The client can be a VB .Net, C# .Net, TestStand or web application. The examples for interfaces in each of these applications are in `Samples` folder.

References required

TekExpressClient.dll has internal reference to *IIdlglib.dll* and *IRemoteInterface.dll*. *IIdlglib.dll* has a reference to *TekDotNetLib.dll*. *IRemoteInterface.dll* provides the interfaces required to perform the remote automations. It is an interface that forms the communication line between the server and the client. *IIdlglib.dll* provides the methods to generate and direct the secondary dialog messages at the client-end.

NOTE. *The end-user client application does not need any reference to above mentioned DLL files. It is essential to have these DLLs (IRemoteInterface.dll, IIdlglib.dll and TekDotNetLib.dll) in same folder location as that of TekExpressClient.dll.*

What steps does a Client need to follow ?

The following are the steps that a client needs to follow to use the TekExpressClient.dll to programmatically control the server:

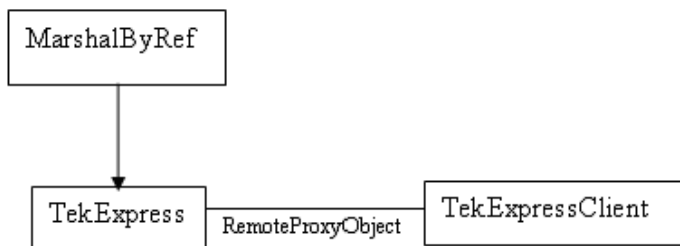
A client UI has to be developed to access the interfaces exposed through the server. This client needs to load `TekExpressClient.dll` to access the interfaces. Once the TekExpressClient.dll is loaded, the client UI can call the specific functions to run the operations requested by the client. Once the client is up and running, it has to do the following to run a remote operation:

1. The client needs to provide the IP address of the PC at which the server is running in order to connect to the server.
2. The client needs to lock the server application to avoid conflict with any other Client that may try to control the server simultaneously. “Lock” would also disable all user controls on server so that server state cannot be changed by manual operation.
3. If any other client tries to access a server which is locked, it will get a notification that the server is locked by another client.
4. When the client has connected to and locked the server, the client can access any of the programmatic controls to run the remote automations.
5. Once the client operations are completed, the server needs to be “unlocked” by the Client.

Server and Client Proxy Objects

Remote Proxy Object

The server exposes a remote object to let the remote client access and perform the server side operations remotely. The proxy object is instantiated and exposed at the server-end through marshalling.



The following is an example:

```
RemotingConfiguration.RegisterWellKnownServiceType (typeof (TekExpressRemoteInterface), "TekExpress Remote interface", wellKnownObjectMode.Singleton);
```

This object lets the remote client access the interfaces exposed at the server side. The client gets the reference to this object when the client gets connected to the server.

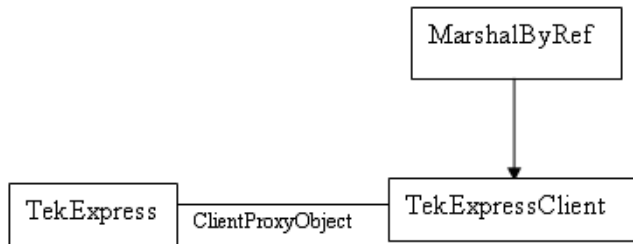
For example,

```
//Get a reference to the remote object
```

```
remoteObject = (IRemoteInterface)Activator.GetObject(typeof(IRemoteInterface), URL.ToString());
```

Client Proxy Object

Client exposes a proxy object to receive certain information.



For example,

```
//Register the client proxy object
```

```
wellKnownServiceTypeEntry[] e = RemotingConfiguration.GetRegisteredWellKnownServiceTypes();
```

```
clientInterface = new ClientInterface();
```

```
RemotingConfiguration.RegisterWellKnownServiceType(typeof(ClientInterface),  
"Remote Client Interface", wellKnownObjectMode.Singleton);
```

```
//Expose the client proxy object through marshalling
```

```
RemotingServices.Marshal(clientInterface, "Remote Client Inteface");
```

The client proxy object is used for the following:

1. To get the secondary dialog messages from the server.
2. To get the file transfer commands from the server while transferring the report.

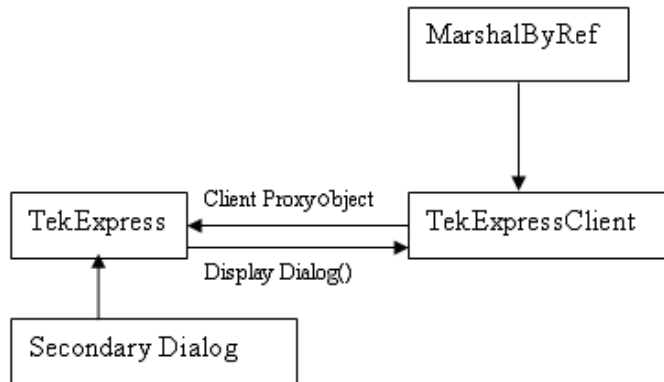
Click here to see examples.

```
clientObject.clientIntf.DisplayDialog(caption, msg, iconType, btnType);
```

```
clientObject.clientIntf.TransferBytes(buffer, read, fileLength);
```


To know more on the topics below, click on the links.

Secondary Dialog Message Handling



The secondary dialog messages from the Secondary Dialog library are redirected to the client-end when a client is performing the automations at the remote end.

In the secondary dialog library, the assembly that is calling for the dialog box to be displayed is checked and if a remote connection is detected, the messages are directed to the remote end.

File Transfer Events

When the client requests the transfer of the report, the server reads the report and transfers the file by calling the file transfer methods at the client-end.

Connect()

Connect(*string* ipAddress, *out string* clientID)

This method connects the client to the server. The client provides the ip address of the server to connect to the server. The server provides a unique clientID when the client is connected to it.

Parameters

Name	Type	Direction	Description
ipAddress	string	IN	The ip address of the server to which the client is trying to connect to. This is required to establish the connection between the server and the client.
clientid	String	OUT	Identifier of the client that is connected to the server. clientid = unique number + ipaddress of the client. For example, 1065-192.157.98.70

Return Value

Value that suggests the status if the connection was established or an error occurred. The return value is an object that can be a boolean value, returning true or a string, returning the error message.

Example

```
try {
    IPAddress[] hostIPAddr = Dns.GetHostAddresses(Dns.GetHostName());
    // Connect to the remoter Server
    remoteObject.Connect(hostIPAddress, clientInterface, out clientID);
    return true;
}
catch (Exception error)
{
    return error;
}
```

Comments

The server has to be active and running for the client to connect to the server. Any number of clients can be connected to the server at a time. Each client will get a unique id.

Disconnect()

Disconnect(*string* id)

This method disconnects the client from the server it is connected to.

Parameters

Name	Type	Direction	Description
id	String	IN	Identifier of the client that is performing the remote function.

Return Value

Integer value that suggests the status of the operation after it has been performed.

1 – Success

-1 – Failure

Example

```
try
{
    string returnUrl = UnlockServer (clientId);
    remoteObject.Disconnect (clientId);
    return 1;
}
```

Comments

When the client is disconnected, it is unlocked from the server and then disconnected. The id is reused.

LockSession()

LockSession(*string* id)

This method locks the server. The client has to call this method before running any of the remote automations. The server can be locked by only one client.

Parameters

Name	Type	Direction	Description
id	String	IN	Identifier of the client that is performing the remote function.

Return Value

String value that suggests the status of the operation after it has been performed.

Example

```
if (!locked)
    return "Session has already been locked!";
returnVal = remoteObject.LockSession(clientId);
if ((OP_STATUS)returnVal == OP_STATUS.SUCCESS)
{
    locked = true;
    return "Session Locked...";
}
```

Comments

When the client tries to lock a server that is locked by another client, the client gets a notification that the server is already locked and it has to wait until the server is unlocked.

If the client locks the server and is idle for a certain amount of time then the server is unlocked automatically from that client.

UnlockSession()

UnlockSession(*string* id)

This method unlocks the server from the client. The client id of the client to be unlocked has to be provided.

Parameters

Name	Type	Direction	Description
id	string	IN	Identifier of the client that is performing the remote function.

Return Value

String that suggests the status of the operation after it has been performed.

Example

```
returnVal = remoteObject.UnlockSession(clientId);  
if ((OP_STATUS)returnVal == OP_STATUS.SUCCESS)  
{  
    locked = false;  
    return "Session Un-Locked...";  
}
```

Comments

When the client is disconnected, it is automatically unlocked.

SetTimeout()

SetTimeout (*string* id, *string* time)

Parameters

Name	Type	Direction	Description
id	string	IN	Identifier of the client that is performing the remote function.
time	string	IN	The time in seconds which refers to the time-out period.

Return Value

String that suggests the status of the operation after it has been performed.

Example

```
if (ClientId == ClientID)
{
    if (locked == true)
    {
        tempTime = Int32.Parse(time);
    }
    if (tempTime < 0)
        return "Enter a valid Timeout Period";
    else
    {
        timeout = tempTime;
        return "Timeout Period Changed";
    }
}
```

Comments

The time parameter gives the time-out period, that is the time the client is allowed to be locked and idle. After the time-out period if the client is still idle, it gets unlocked.

The time parameter should be a positive integer. If it is not a positive integer, the client is prompted to provide a valid time-out period.

GetTimeOut()

GetTimeOut (*string* id)

Parameters

Name	Type	Direction	Description
id	string	IN	Identifier of the client that is performing the remote function.

Return Value

String that suggests the status of the operation after it has been performed.

Example

```
if (ClientId == ClientID)
{
    ResetTimer();
    return timeOut.ToString();
}
```

Comments

The timeout period is a positive integer.

GetDutId()

GetDutId(*string* id, *string* dutId)

This method gives the DUT id of the current set-up.

Parameters

Name	Type	Direction	Description
id	string	IN	Identifier of the client that is performing the remote function.
dutId	string	OUT	The DUT id of the set-up.

Return Value

String that gives the timeout period (in seconds) of the client.

Example

```
returnVal = remoteObject.GetDutId(clientId, out id);  
if ((OP_STATUS)returnVal == OP_STATUS.SUCCESS)  
{  
    return id;  
}  
else  
    return CommandFailed(returnVal);
```

Comments

The dutId is an OUT parameter whose value is set after the server processes the request.

ChangeDutId()

ChangeDutId(*string* id, *string* dutName)

This method changes the DUT id of the set-up. The client has to provide a valid DUT id.

Parameters

Name	Type	Direction	Description
id	string	IN	Identifier of the client that is performing the remote function.
dutName	string	IN	The new DUT id of the set-up.

Return Value

String that suggests the status of the operation after it has been performed.

Example

```
If (dut Id.Length <=0 && locked == true)
    return "Enter a valid DUT-ID";
returnVal = remoteObject.ChangeDutId(clientId, dutId);
if ((OP_STATUS)returnVal == OP_STATUS.SUCCESS)
    return "DUT Id Changed...";
else
    return CommandFailed(returnVal);
```

Comments

If the dutName parameter is null, the client is prompted to provide a valid DUT id.

SaveSession()

SaveSession(*string* id, *string* name)

Saves the current session. The name of the session is provided by the client.

Parameters

Name	Type	Direction	Description
id	string	IN	Identifier of the client that is performing the remote function.
name	string	IN	The name of the session being saved.

Return Value

String that suggests the status of the operation after it has been performed.

Example

```
returnVal = remoteObject.SaveSession(clientId,sessionName);  
if ((OP_STATUS)returnVal == OP_STATUS.SUCCESS)  
    return "Session Saved...";  
else  
    return CommandFailed(returnVal);
```

Comments

The name parameter cannot be empty. If it is empty, the client is prompted to provide a valid name.

Once the session is saved under 'name' you cannot use this method to save the session in a different name. Instead SaveSessionAs can be used.

SaveSessionAs()

SaveSessionAs(*string* id, *string* name)

Saves the current session in a different name every time this method is called. The name of the session is provided by the client.

Parameters

Name	Type	Direction	Description
id	string	IN	Identifier of the client that is performing the remote function.
name	string	IN	The name of the session being saved.

Return Value

String that suggests the status of the operation after it has been performed.

Example

```
returnVal = remoteObject.SaveSessionAs(clientId,sessionName);  
if ((OP_STATUS)returnVal == OP_STATUS.SUCCESS)  
    return "Session Saved...";  
else  
    return CommandFailed(returnVal);
```

Comments

The same session is saved under different names using this method. The name parameter cannot be empty. If it is empty, the client is prompted to provide a valid name.

RecallSession()

RecallSession(*string* id, *string* name)

Recalls a saved session. The name of the session is provided by the client.

Parameters

Name	Type	Direction	Description
id	string	IN	Identifier of the client that is performing the remote function.
name	string	IN	The name of the session being recalled.

Return Value

String that suggests the status of the operation after it has been performed.

Example

```
returnVal = remoteObject.RecallSession(clientId,sessionName);  
if ((OP_STATUS)returnVal == OP_STATUS.SUCCESS)  
    return "Session Recalled...";  
else  
    return CommandFailed(returnVal);
```

Comments

The name parameter cannot be empty. If it is empty, the client is prompted to provide a valid name.

Run()

Run(*string* id)

Runs the setup. Once the server is set up and is configured, it can be run remotely using this function.

Parameters

Name	Type	Direction	Description
id	string	IN	Identifier of the client that is performing the remote function.

Return Value

String that suggests the status of the operation after it has been performed.

Example

```
returnVal = remoteObject.Run(clientId);  
if ((OP_STATUS)returnVal == OP_STATUS.SUCCESS)  
    return "Run started...";  
else  
    return CommandFailed(returnVal);
```

Comments

When the run is performed the status of the run is updated periodically using a timer.

Stop()

Stop(*string* id)

Stops the run operation.

Parameters

Name	Type	Direction	Description
id	string	IN	Identifier of the client that is performing the remote function.

Return Value

String that suggests the status of the operation after it has been performed.

Example

```
returnVal = remoteObject.Stop(clientId);  
if ((OP_STATUS)returnVal == OP_STATUS.SUCCESS)  
    return "Stopped...";  
else  
    return CommandFailed(returnVal);
```

Comments

When the session is stopped the client is prompted to stop the session and is stopped at the consent.

QueryStatus()

QueryStatus(*string* id, *out string[]* status)

This method gives the status of the run as messages. The status messages are generated once the run is started.

Parameters

Name	Type	Direction	Description
id	string	IN	Identifier of the client that is performing the remote function.
status	string array	OUT	The list of status messages generated during run.

Return Value

String that suggests the status of the operation after it has been performed.

Example

```
returnVal = remoteObject.QueryStatus(clientId, out statusMessages);  
if ((OP_STATUS)returnVal == OP_STATUS.SUCCESS)  
    return "Status updated...";  
else  
    return CommandFailed(returnVal);
```

Comments

The status messages are updated periodically after the run begins. The status is an out parameter which is set when the server processes the request.

TransferReport()

TransferReport(*string* id, *string* filePath)

This method transfers the report generated after the run. The report contains the summary of the run. The client has to provide the location where the report is to be saved at the client-end.

Parameters

Name	Type	Direction	Description
id	string	IN	Identifier of the client that is performing the remote funtion.
filePath	string	IN	The location where the report has to be saved in the client.

Return Value

String that suggests the status of the operation after it has been performed.

Example

```
returnVal = remoteObject.TransferReport(clientId);  
if ((OP_STATUS)returnVal == OP_STATUS.SUCCESS)  
    return "Transferred...";  
else  
    return CommandFailed(returnVal);
```

Comments

If the client does not provide the location to save the report, the report is saved at C:\ProgramFiles.

CheckSessionSaved()

CheckSessionSaved(*string* id, *out bool* saved)

This function is called when a check is to be made to know if the current session is saved.

Parameters

Name	Type	Direction	Description
id	string	IN	Identifier of the client that is performing the remote function.
saved	bool	OUT	Boolean which represents if the current session is saved.

Return Value

Void

Example

```
if (clientId == ClientID)
{
    returnVal = remoteObject.IsSessionSaved(id,out saved);
}
```

Comments

The saved parameter gives the boolean value suggesting if the current session is saved or not. This is used as a check in SaveSession() and SaveSessionAs() Functions.

ErrorCodes

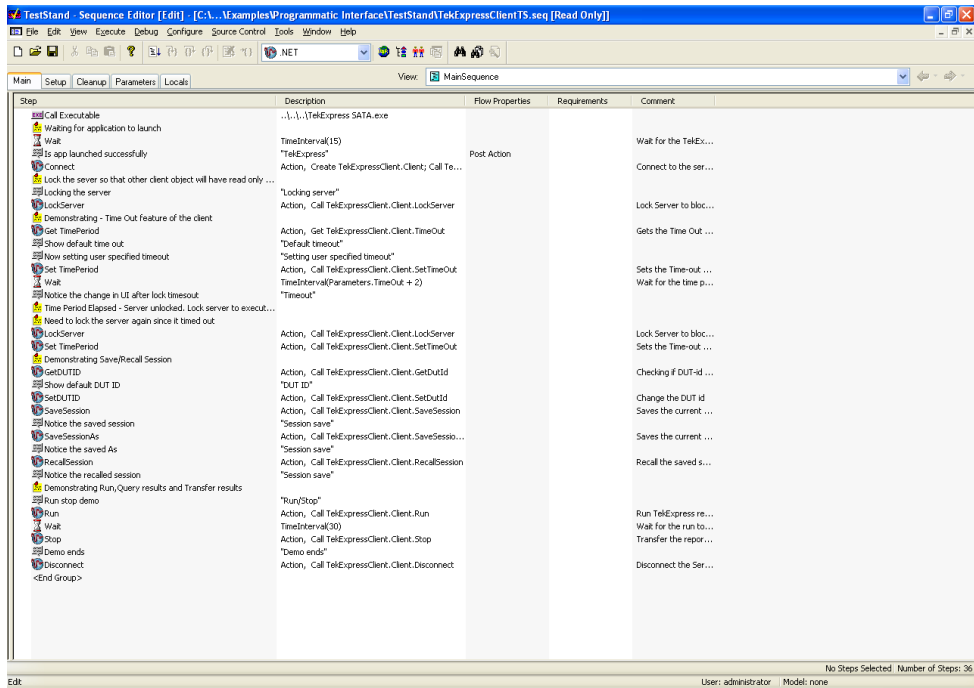
The return value of the remote automations at the server-end is OP_STATUS which is changed to a string value depending on its code and returned to the client.

The values of OP_STATUS are as follows:

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

Example

The following is an example for NI TestStand Client available in the path, C:\Program Files\Tektronix\TekExpress\Examples\Programmatic Interface\TestStand



Instrument Connectivity

Related Topics

[User Interface](#)

[TestStand Runtime Engine Installation](#)

If the instrument(s) are displayed in TekVISA Instrument Manager but not in the TekExpress Instrument Bench, check the following:

- Only those instruments that respond to *i dn? and *opt? queries successfully, are displayed in Instrument Bench.
- Ensure that VXI-11 Server is running on the instruments.

If Instrument initialization fails during test sequence execution, do the following:

It is observed that GPIB communication with instrument over Tek-VISA layer is not initialized if in TekVISA Instrument manager the search criteria is turned-off even if valid instrument is connected in the network. It is necessary to turn ON the respective search criteria by opening the TekVISA Instrument manager.

User Interface

Related Topics

[Instrument Connectivity](#)

[TestStand Runtime Engine Installation](#)

The Acquire tab is disabled.

For a selected test suite, the test is performed on a live acquisition. If test(s) such as PHY-TSG-OOB can be performed on pre-acquired waveforms, this tab is active.

TestStand Run time Engine Installation

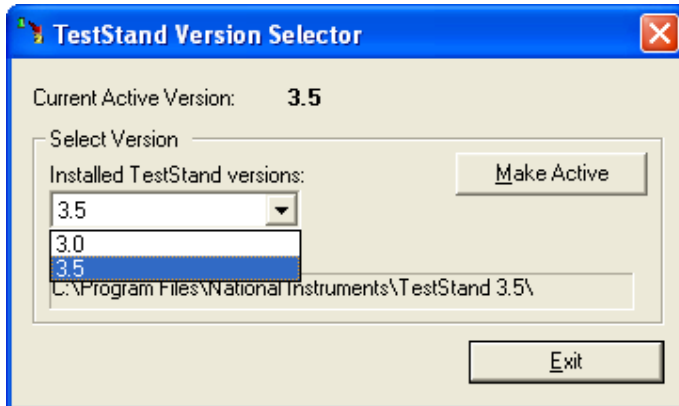
Related Topics

[Instrument Connectivity](#)

[User Interface](#)

Managing multiple versions of TestStand installed on the system.

TekExpress installs TestStand version 3.5 runtime engine. If you have versions other than 3.5, while working with TekExpress, ensure that the version shipped with TekExpress is active. You can do so by clicking **Start > Programs > National Instruments > TestStand 3.5 > TestStand Version Selector**.



Test Limit is Single Sided

Related Topics

[Instrument Connectivity](#)

[TestStand Runtime Engine Installation](#)

[User Interface](#)

The test limit is single sided but report shows second value and value is shown as 0.

If the test limits are single sided for limits such as GT(>) Greater than, LT(<) Less than; then the second value is by default 0 and is ignored by the test automation script. In such cases, while analyzing the report the second value should be ignored.

Report shows as NAN

Related Topics

[Instrument Connectivity](#)

[TestStand Runtime Engine Installation](#)

[User Interface](#)

[Test Limit is Single Sided](#)

Some of the result values in the report are shown as NAN.

NAN is IEEE definition for “Not a Number”. The possible causes are as follows:

- The captured pattern (HFTP, MFTP, LFTP, LBP waveform files) for the analysis does not contain a valid pattern.
- The NAN value is commonly seen in TSG measurements when LFTP pattern is required for analysis but the captured pattern is not true LFTP.
- The NAN value can be seen in the final reports if a test algorithm does not successfully evaluate a result due to one or more reasons listed above.

For trouble shooting, you can analyze the captured waveform using pattern analyzer utility which is available in TekExpress\ACP folder. The patternAnalyzer.exe need to be run from MS DOS prompt and takes the following command line argument:

```
patternAnalyzer.exe <InterfaceSpeed> <WaveformFile> <OutputTXTfile> where,
```

InterfaceSpeed should be specified as either Gen1 or Gen2.

waveform file is complete waveform file path.

outputTXTfile is output text file path.

For example, patternAnalyzer.exe “Gen2” “X:\DisplayPort\SavedSession\DUT001\20080206_185914\BISTL_HFTP_G2_Drive_DW2_Diff.wfm” “X:\results.txt”.
Open the contents of X:\results.txt to see the results.

Shortcut Keys

The following table lists the short cut keys to access the application:

Table 10: Keyboard shortcut keys

Menu	Shortcut keys
File	Alt + F
New Session	Ctrl + N
Open Session...	Ctrl + O
Save Session...	Ctrl + S
Save Session As...	Alt + F + A
Print Preview Report	Alt + F + V
Print Report...	Ctrl + P
Recent Sessions	Alt + F + E
Exit	Ctrl + X
View	Alt + V
Log File	Ctrl + L
Tools	Alt + T
Instrument Bench...	Ctrl + I
Help	Alt + H
TekExpress Help (F1)	Alt + H + H
About...	Alt + H + A

Error Codes for TekExpress

The following table lists the error codes for the application. Most of the errors require that you restart the system.

Table 11: Error codes and Description

Error Code	Description
<10000	TestStand generated error.
10001 - 11000 – Data Manager related errors	
10001	Insufficient Data. The Record could not be inserted. The following fields are empty or have insufficient data.
10002	Could not retrieve the record. The specified index is not valid.
11001 - 14000 – ICP related errors	
11001	Operation mode is not set as specified.
11002	SetUp file Error: Specified SetUp file is not set.
11003	Operation state is not set as specified.
11004	Specified waveform is not loaded into channel memory.
11005	Specified channel is not enabled.
11006	Interleave State could not be set to off.
12001	Operation State is not set to required value.
12002	Display state is not set to required value.
12003	Horizontal Scale is not set to required value.
12004	Vertical scale is not set to required value.
12005	Vertical Position is not set to required value.
12006	Deskew is not set to specified value.
12007	Out of Range Error-RunTime Error Message.
14001 - 18000 – SCP related errors	
14001	Timeout Error: Application could not be activated.
14002	JIT3 Application is already running.
14003	Cannot activate JIT3 application. Some other application is running on Scope.
14004	Error recalling the specified setup.
14005	Error setting the specified Sequencer State.
14006	Error in closing the Application.
14007	Error loading the default setup.

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