

**TekExpress® Serial ATA  
Automated Solutions  
Quick Start User Manual**





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Automated Solutions  
Quick Start User Manual**

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## **Contacting Tektronix**

Tektronix, Inc.  
14200 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.tektronix.com](http://www.tektronix.com) to find contacts in your area.

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In order to obtain service under this warranty, Customer must notify Tektronix of the defect before the expiration of the warranty period and make suitable arrangements for the performance of service. Customer shall be responsible for packaging and shipping the defective product to the service center designated by Tektronix, with shipping charges prepaid. Tektronix shall pay for the return of the product to Customer if the shipment is to a location within the country in which the Tektronix service center is located. Customer shall be responsible for paying all shipping charges, duties, taxes, and any other charges for products returned to any other locations.

This warranty shall not apply to any defect, failure or damage caused by improper use or improper or inadequate maintenance and care. Tektronix shall not be obligated to furnish service under this warranty a) to repair damage resulting from attempts by personnel other than Tektronix representatives to install, repair or service the product; b) to repair damage resulting from improper use or connection to incompatible equipment; c) to repair any damage or malfunction caused by the use of non-Tektronix supplies; or d) to service a product that has been modified or integrated with other products when the effect of such modification or integration increases the time or difficulty of servicing the product.

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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.

---

## Environmental Considerations

This section provides information about the environmental impact of the product.

### Product End-of-Life Handling

Observe the following guidelines when recycling an instrument or component:

**Equipment Recycling.** Production of this equipment required the extraction and use of natural resources. The equipment may contain substances that could be harmful to the environment or human health if improperly handled at the product's end of life. In order to avoid release of such substances into the environment and to reduce the use of natural resources, we encourage you to recycle this product in an appropriate system that will ensure that most of the materials are reused or recycled appropriately.



This symbol indicates that this product complies with the applicable European Union requirements according to Directives 2002/96/EC and 2006/66/EC on waste electrical and electronic equipment (WEEE) and batteries. For information about recycling options, check the Support/Service section of the Tektronix Web site ([www.tektronix.com](http://www.tektronix.com)).

## Preface

TekExpress is the Tektronix Compliance 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 uses a highly modular architecture that enables deploying automated test solutions for various serial standards in a relatively short time. This release of TekExpress provides compliance test automation solutions for the Serial ATA Gen 1 and Gen 2 standard.

Options that are available with TekExpress Serial ATA are:

- PHY-TSG-OOB Test Suite
- RSG-RMT Test Suite
- Rx-Tx Test Suite
- TekExpress SATA Bundle for Host and Drive Test Suite
- SI Cable Tests for TekExpress SATA

## Key Features




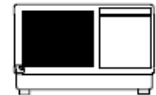



The application provides the following features:

- Complete SATA Gen1 and Gen2 Test Coverage for Hosts, Drives and Cables.
- Completely automated single button solution.
- Significant reduction in testing time through automation.
- All 150+ measurements, (UTD 1.2 and UTD 1.3 conformant) SATA II Gen1/Gen2 MOIs.
- Single and simple Microsoft Windows XP user interface for multi-instrument testing.
- Repeatable and accurate results.
- Automatic HTML report and SATA-IO (MS Excel) scorecard generation.
- Receiver Margin Testing.
- Direct Synthesis and Device State control eliminates the need for multiple sources.
- Powered by NI TestStand™
- Seamlessly integrate with high-level TestStand Automation Layer.

## Documentation

This manual describes the basic installation and operation of the TekExpress application. For more detailed information, see the online help and installation manuals. The following information is available for this product:

**Table i: Related documents**

|  |             |  |   |
|--|-------------|--|---|
| TekExpress Serial ATA Online Help, English                   | 076-0096-xx |   | <b>Start &gt; Programs &gt; Tektronix &gt; TekExpress &gt; TekExpress SATA &gt; Help</b>                  |
| TekExpress Serial ATA User Manual, English (PDF)             | 077-0044-xx |   | <br>(Documents folder) |
| TekExpress Serial ATA Quick Start User Manual, English (PDF) | 071-2298-xx |  |                        |
| TekExpress Serial ATA Installation Manual, English (PDF)     | 071-2268-xx |   | <br>(Documents folder) |

# Install the Application

The TekExpress application must be installed on a computer or on a Tektronix oscilloscope.

## Before Installation


- Refer to the *TekExpress Serial ATA Automated Solutions Installation Manual* to find out about the prerequisites.
- Read the `Readme.txt` file on the product software DVD.

## Installation

1. Close all applications.
2. Insert the product software DVD into the DVD-ROM drive of the computer or oscilloscope.
3. The installation wizard will guide you through the installation. For information on installation, refer to *TekExpress Serial ATA Automated Solutions Installation Manual*.
4. The software files will be installed in `C:\Program Files\Tektronix\TekExpress`.

## Starting the Application

To start the software do one of the following:

- From the Start menu, select **Start > Programs > Tektronix > TekExpress > TekExpress SATA**.
- Double-click  on the desktop.

## Closing the Application

To close the application, do either of the following:

- Select **File > Exit**.
- Click .

Using other methods to exit the application will result in abnormal termination.



# Using TekExpress Application

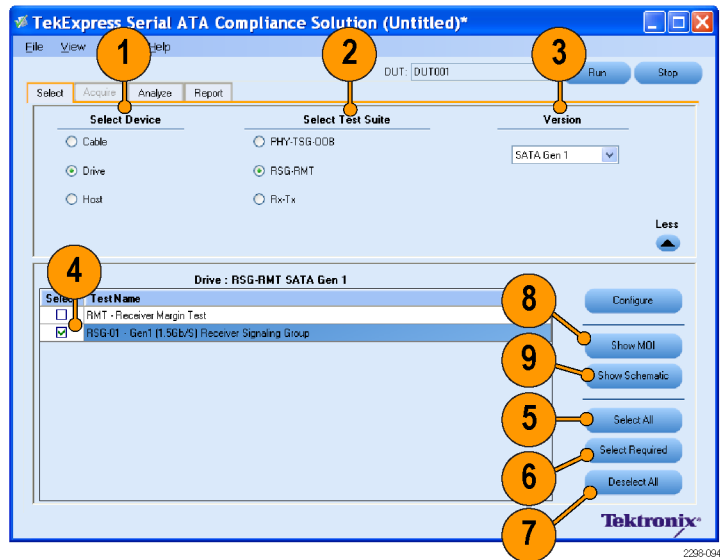
## Process Flow

Follow steps 1 to 6 to select and run a test to check for compliance. Details for each of these actions are given on the following pages.

1. Select a device.
2. Select the test suite, choose the version.
3. Select the test.
4. Configure the test parameters.
5. View and select connected instruments.
6. Run the test.
7. View the progress of acquisition.
8. View the progress of analysis.
9. View and print the generated report.

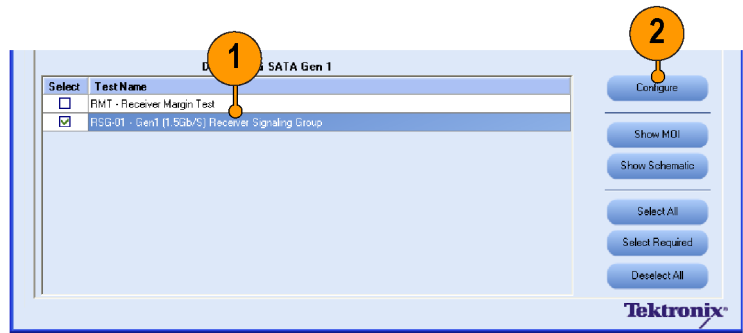
## Select a Test

1. Select a Device type.
2. Select the Test Suite.
3. Choose the version of the selected test suite from the **Version** drop-down list.
4. Select the test you want to run.  
You can select multiple tests from the list.
5. To select all the tests in the list, click **Select All**.
6. To select only the mandatory tests, click **Select Required**.
7. Click **Deselect All**, to disable the tests.
8. To see the Method Of Implementation of the selected test, click **Show MOI**.
9. To see the schematic diagram of the test setup, click **Show Schematic**.

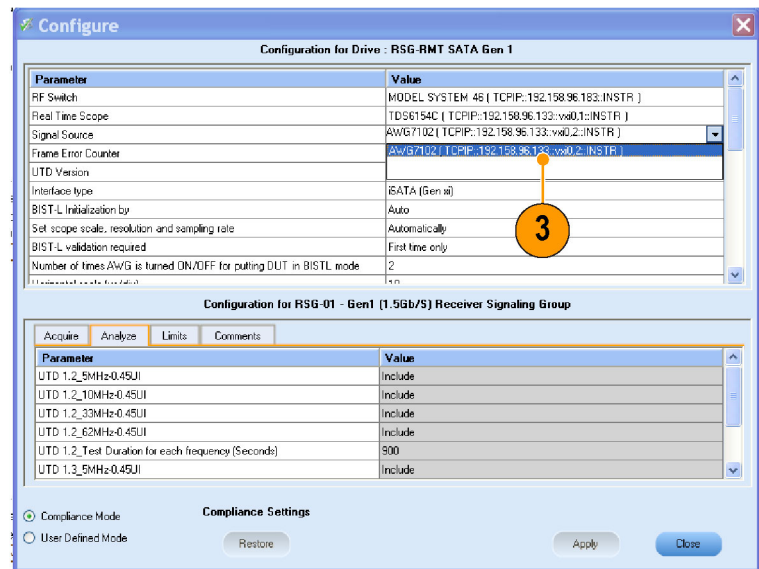


## Configure the Test(s)

1. Highlight the test you want to configure by clicking the test name.
2. Click **Configure**.

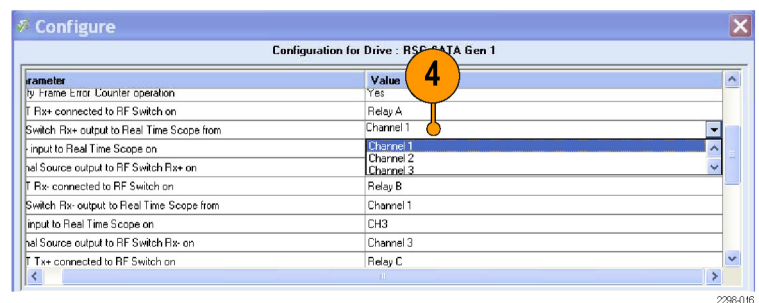


3. If multiple instruments are connected, choose the correct instrument from the drop-down list in the general parameters tab.



4. Verify schematic related parameters such as “Channel of the Oscilloscope” and so on.

**NOTE.** The default setup is according to the schematic provided with the test suite.



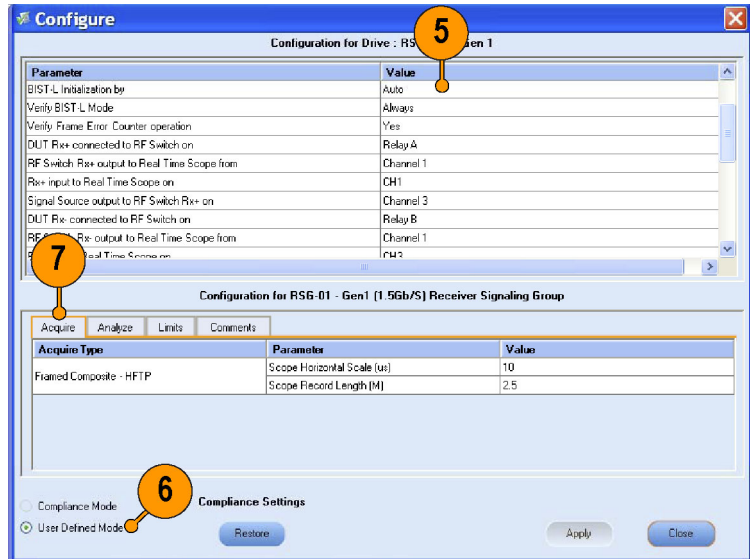


5. You can also change miscellaneous parameters such as "BIST-L Initialization by".

**NOTE.** General parameters are common to all tests, and can be edited even in the Compliance Mode. However, cells that are grayed cannot be modified in the Compliance Mode.

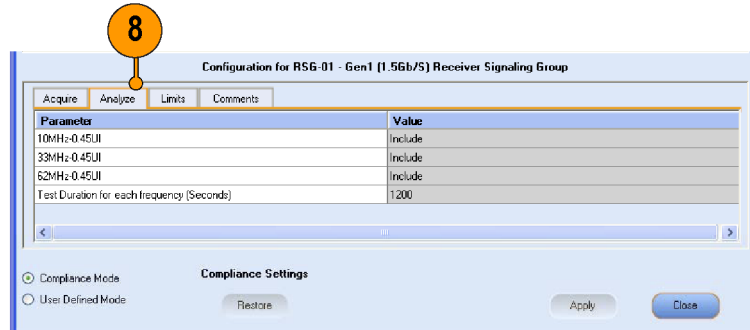
You can generally use the default settings in Compliance Mode.

6. To configure the test parameters, select **User Defined Mode**.
7. Click the **Acquire** tab to edit parameters related to acquisition.



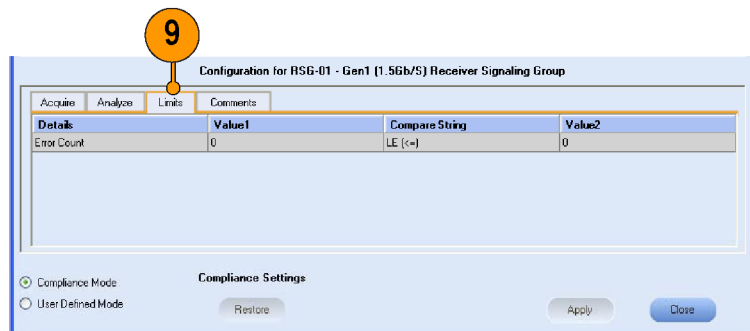
2298-015

8. Click the **Analyze** tab to edit Analysis parameters.



2298-011

9. View the measurement limits in the **Limits** tab.  
Refer to the Online Help for various test limit comparisons.

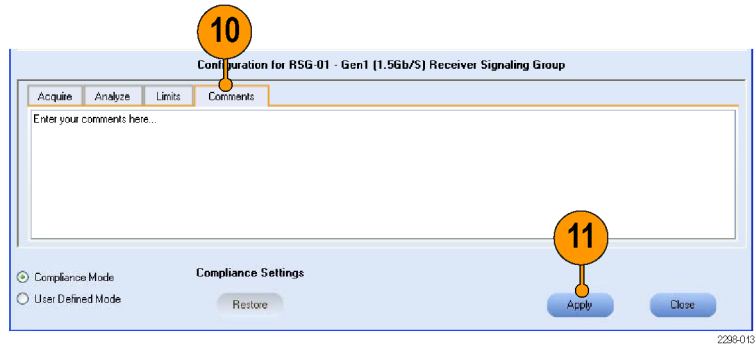


2298-019

10. You can enter test related comments in the **Comments** tab.

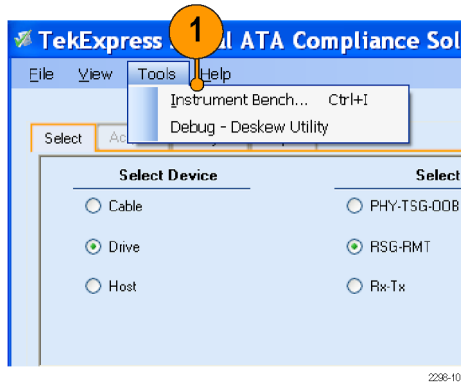
**NOTE.** If you want to change the settings to default, click **Restore**. This option will restore the settings to Compliance Mode.

11. Click **Apply**.  
Use the File Menu to Save the session.

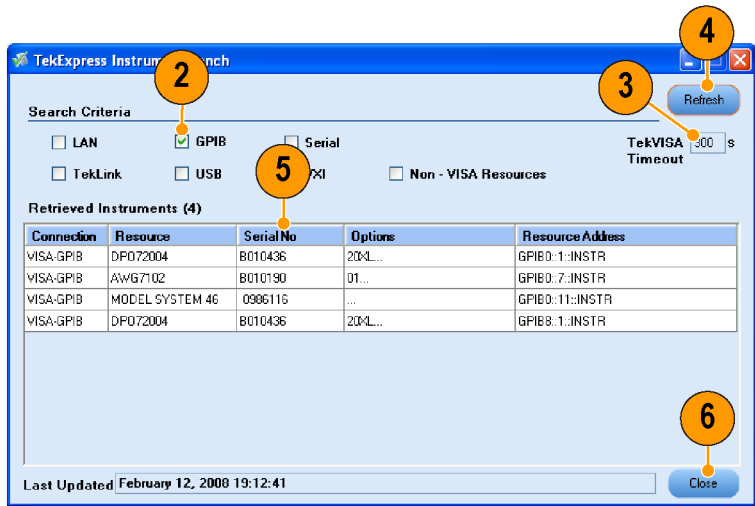


## View and Select Connected Instruments

1. Click **Tools > Instrument Bench**.

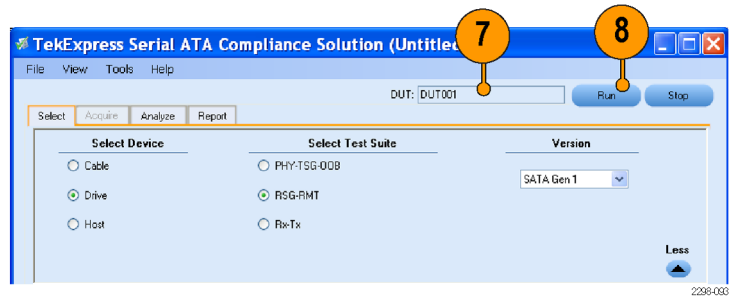


2. Select any of the **Search Criteria**.
3. Enter the time in seconds in the **TekVISA Timeout** field.
4. Click **Refresh**.
5. The results of the instrument search are displayed in the **Retrieved Instruments** table.
6. Click **Close**.



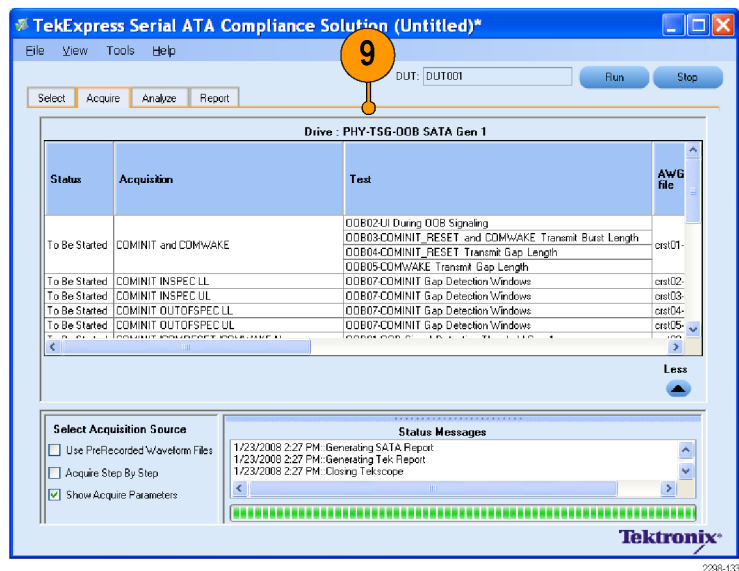
## Run the Test

7. Enter the ID of the Device to be tested in the **DUT** field.
8. Click **Run** to run the test.



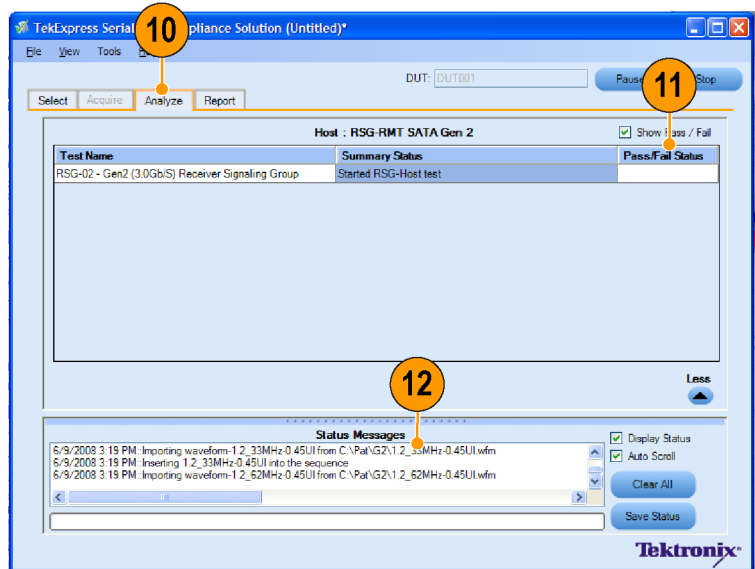
## View the Progress of Acquisition

9. The Acquire panel shows the waveform acquisition details for the tests in the currently selected test suite.



## View the Progress of Analysis

10. When the tests are running, the status and progress of the tests are displayed in the **Analyze** tab. The application checks to see if the device has passed the test.
11. You can select **Show Pass/Fail** option to know whether the test has passed or failed.
12. The Status Messages window time stamps all runtime messages and displays them.



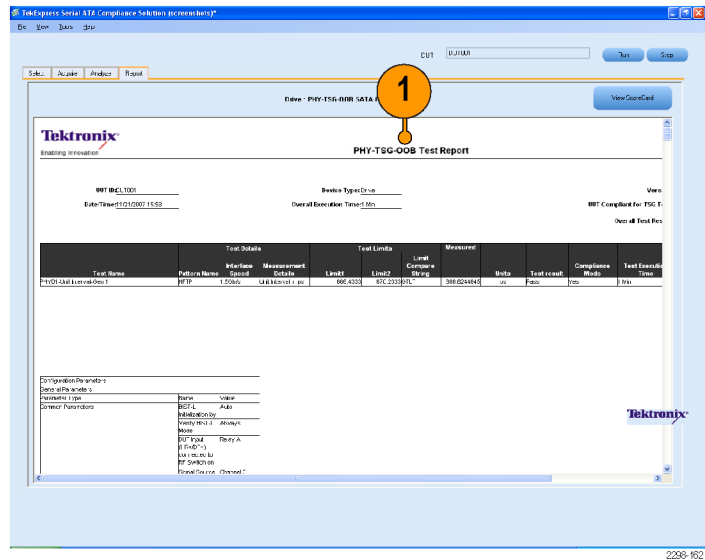
0142-004

## View the Report

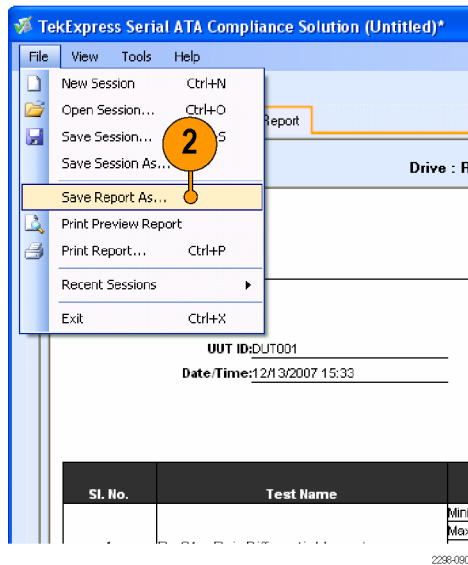
You can generate and print a detailed report as described here.

1. After you have successfully run one or more test(s), a report summary is generated in HTML format.

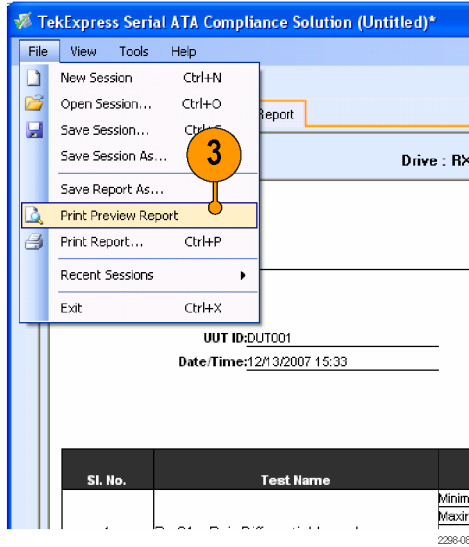
**NOTE.** Select “View Scorecard” to view the test result in standard specific format.



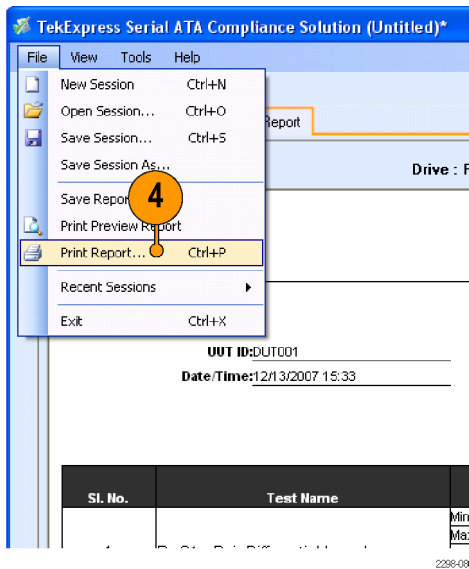
2. To save the report summary in the desired location, select **File > Save Report As**.



3. To preview the report before printing, select **File > Print Preview Report**.



4. Select **File > Print Report**.



# Application Examples

## RSG-RMT Suite

### Testing RSG-01 - Gen1 (1.5 Gb/s) Receiver Signalling Group on a Drive

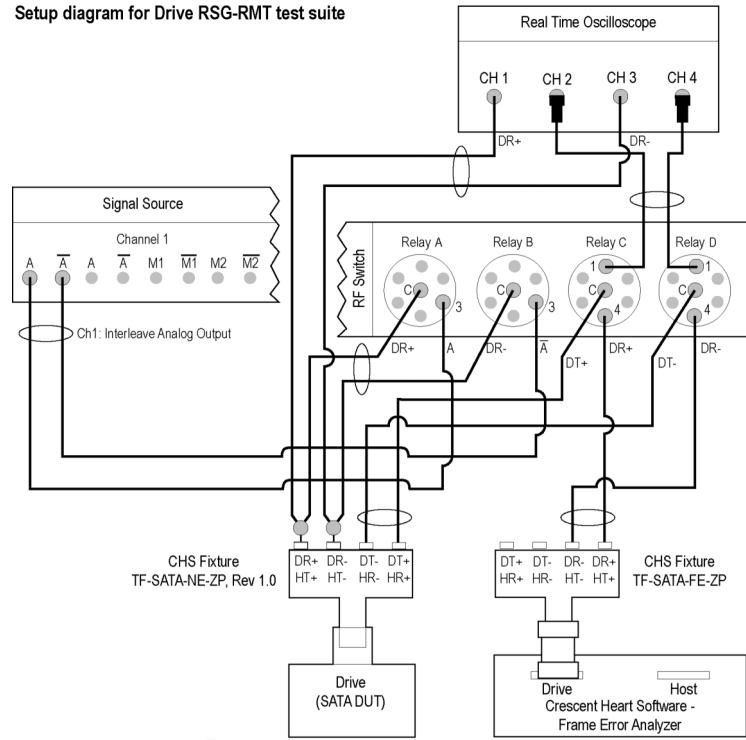
The following equipment is required to set up the application:

| Resource               | Model supported   |
|------------------------|---|
| Signal Source          | Tektronix AWG7102 (Option 6)  |
| Real Time Oscilloscope | <ul style="list-style-type: none"> <li>■ Tektronix DPO/DSA72004/B, DPO/DSA71604/B, DPO/DSA71254/B, TDS6154C, and TDS6124C</li> <li>■ For Gen1– only testing, the following oscilloscopes are also acceptable: DPO/DSA70804/B or TDS6804B</li> </ul> |
| RF Switch              | Keithley S46-6666A (Optional)   |
| Frame Error Analyzer   | Crescent Heart Software SATA II probe adapter   |
| Test Fixture           | Crescent Heart Software Fixture TF-SATA-NE-ZP, TF-SATA-FE-ZP  |
| DUT                    | A SATA Drive to test  |

This test verifies that the SATA Gen1 Drive device will receive a 1.5 Gbps stressed data pattern without receive errors.

1. Connect the DUT to the equipment as shown in the connection diagram.

Setup diagram for Drive RSG-RMT test suite



Matched pair of SMA cables

6 dB attenuators

NOTE: Terminate all unused outputs on the RF Switch with 50 ohms.  
 Terminate all unused ports on the CHS test fixtures with 50 ohms.

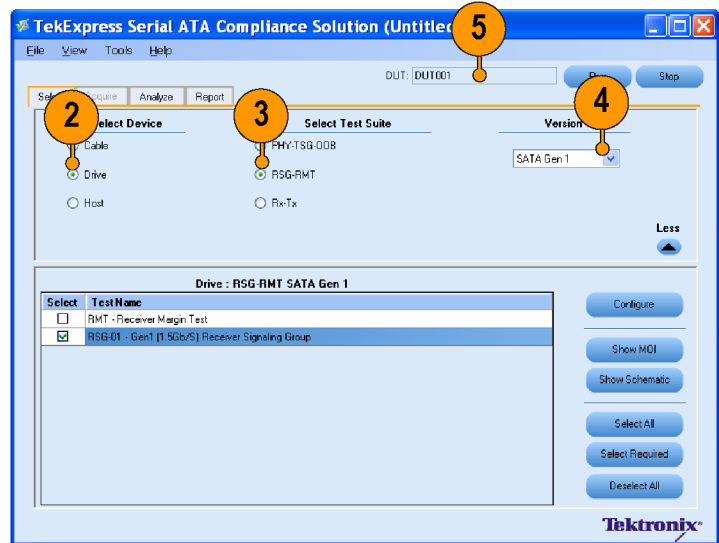
CAUTION: Do not connect the output of the signal source directly to the CHS fixture. The signal must go through the RF Switch.

The CHS fixture notations in the schematic are with reference to Rev 1.0 of the fixture. If you are using fixtures before Rev 1.0, the fixture notations are in reverse order. For example, DT+/HR+ should be read as DR+/HT+.

If DUT Power Cycle sequence is automated using DC output of Signal Source, then do the following:  
 -Connect Channel-1 of DC output to pin #14 (and pin #15 to GND) in case of 20 pin Molex connector of AT/ATX power supply.  
 -Connect Channel-1 of DC output to pin #16 (and pin #17 to GND) in case of 24 pin Molex connector of AT/ATX power supply.



2. Select **Drive** as the device type.
3. Select **RSG-RMT** as the Test Suite.
4. Select **SATA Gen 1** as the test suite version.
5. Enter the DUT ID in the DUT field.

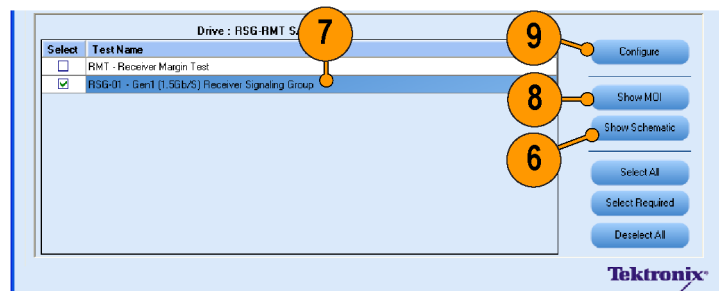


2298-147

6. If you want to verify the test setup before running the tests, click **Show Schematic**.
7. Select **RSG-01 – Gen 1 (1.5 Gb/S) Receiver Signalling Group**.

**NOTE.** *RSG-01 - Gen 1 (1.5 Gb/Sec) Receiver Signalling Group will be a compliance test which is a mandatory test.*

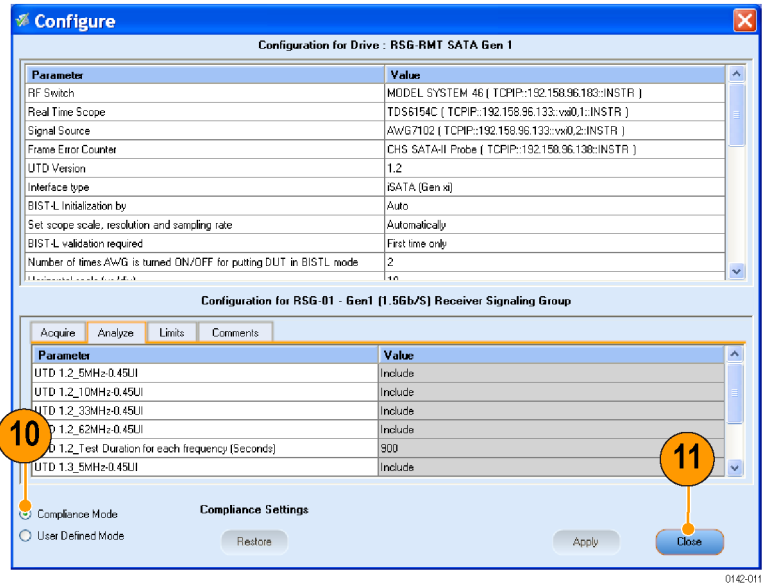
8. To view the Method of Implementation for the RSG-RMT test, click **Show MOI** in the application.
9. Click **Configure** to open the Configuration panel.



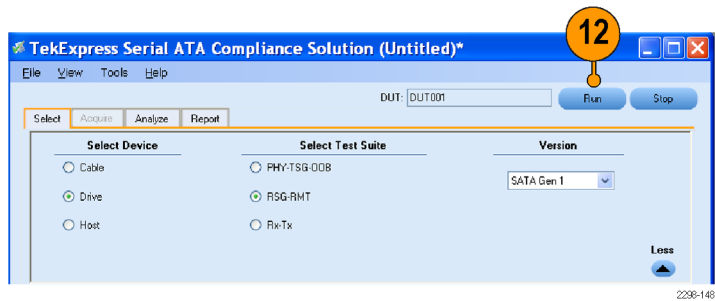
2298-148

10. You can generally use the default values in the **Compliance Mode**.

11. Click **Close**.

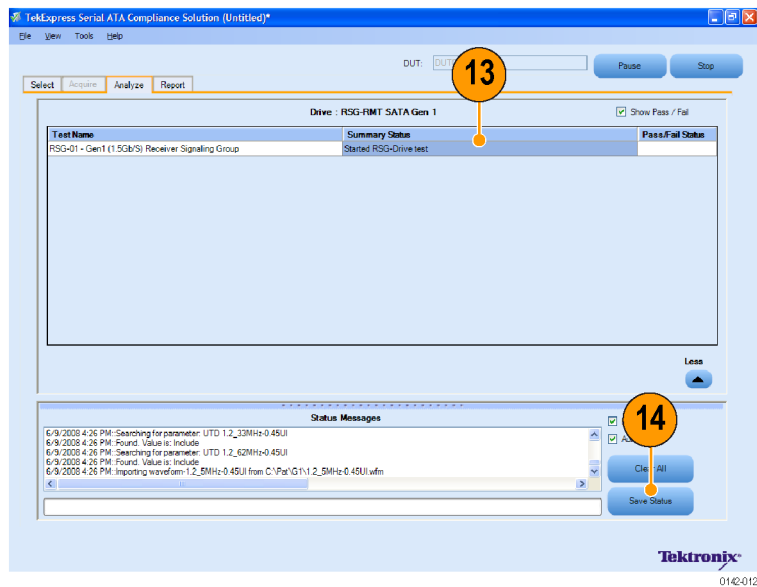


12. Click **Run** to run the test.

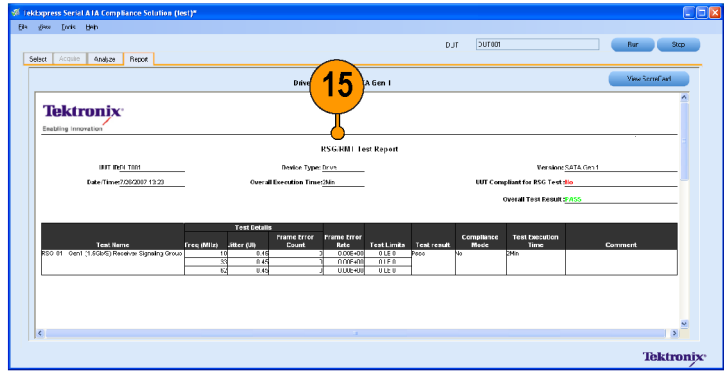


13. Observe that only the **RSG-01 – Gen 1 (1.5 Gb/S) Receiver Signalling Group** is checked for compliance. Other tests are skipped. The status of the tests is displayed in the **Status Messages** window.

14. Click **Save Status** to save the status messages.



- When the tests complete, a report appears in the **Report** panel.



2398-144

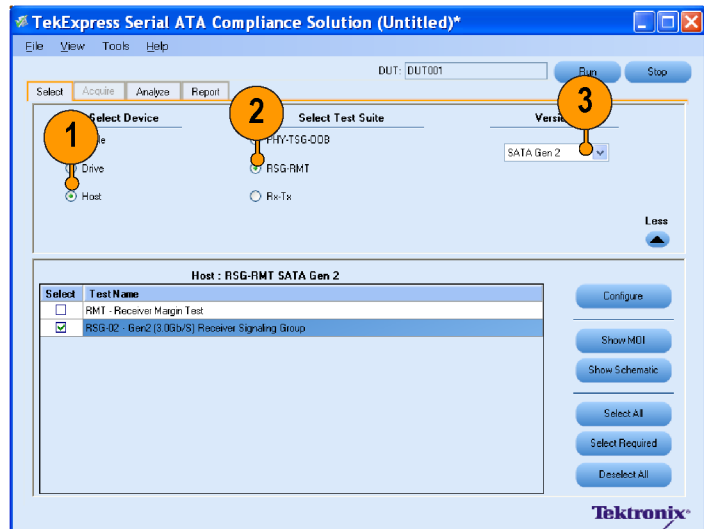
## Testing RSG-02 - Gen2 (3.0Gb/s) Receiver Signalling Group on a Host

This test verifies that the SATA Host device will receive a 3.0 Gbps stressed data pattern without receive errors.

The following equipment is required to set up the application:

| Resource               | Model supported   |
|------------------------|---|
| Signal Source          | Tektronix AWG7102 (Option 6)  |
| Real Time Oscilloscope | <ul style="list-style-type: none"> <li>■ Tektronix DPO/DSA72004/B, DPO/DSA71604/B, DPO/DSA71254/B, TDS6154C, and TDS6124C</li> <li>■ For Gen1- only testing, the following oscilloscopes are also acceptable: DPO/DSA70804/B or TDS6804B</li> </ul> |
| RF Switch              | Keithley S46-6666A (Optional)   |
| Frame Error Analyzer   | Crescent Heart Software SATA II probe adaptor   |
| Test Fixture           | Crescent Heart Software Fixture TF-SATA-NE-ZP, TF-SATA-FE-ZP  |
| DUT                    | A SATA Host to test   |

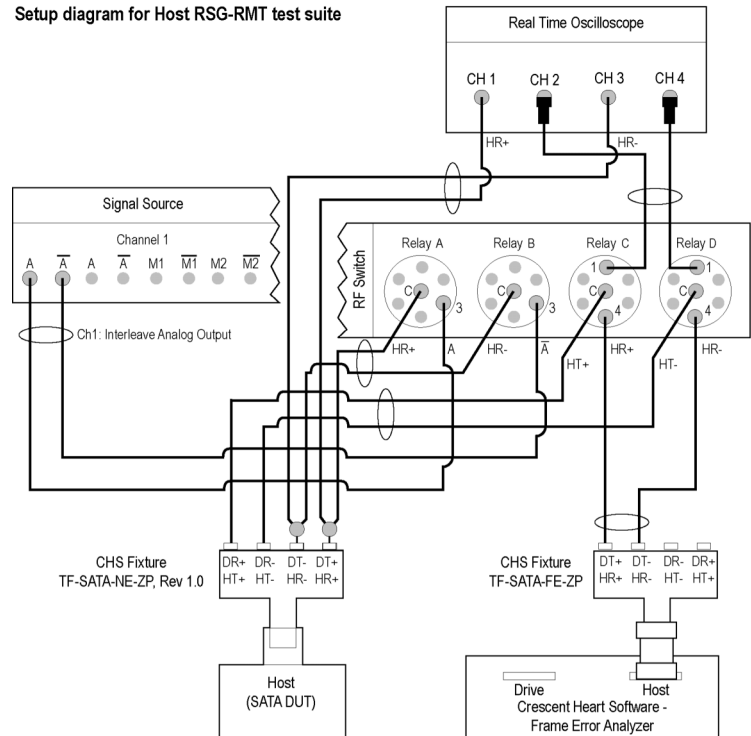
1. Select **Host** as the device type.
2. Select **RSG-RMT** as the test suite.
3. Select **SATA Gen 2** as the test suite version.



2298-153

4. Connect the DUT to the equipment as shown in the setup diagram.

Setup diagram for Host RSG-RMT test suite



Matched pair of SMA cables

6 dB attenuators

NOTE: Terminate all unused outputs on the RF Switch with 50 ohms.  
 Terminate all unused ports on the CHS test fixtures with 50 ohms.

CAUTION: Do not connect the output of the signal source directly to the CHS fixture. The signal must go through the RF Switch.

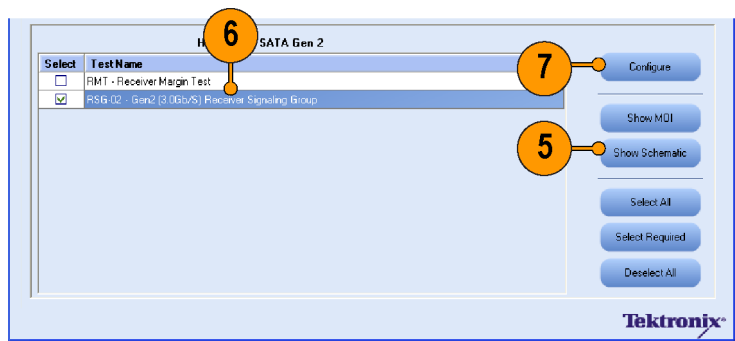
The CHS fixture notations in the schematic are with reference to Rev 1.0 of the fixture. If you are using fixtures before Rev 1.0, the fixture notations are in reverse order. For example, DT+/HR+ should be read as DR+/HT+.

If DUT Power Cycle sequence is automated using DC output of Signal Source, then do the following:  
 -Connect Channel-1 of DC output to pin #14 (and pin #15 to GND) in case of 20 pin Molex connector of AT/ATX power supply.  
 -Connect Channel-1 of DC output to pin #16 (and pin #17 to GND) in case of 24 pin Molex connector of AT/ATX power supply.

5. To verify the test setup before running the tests, click **Show Schematic**.
6. Select **RSG-02 - Gen2 (3.0 Gb/s) Receiver Signalling Group**.

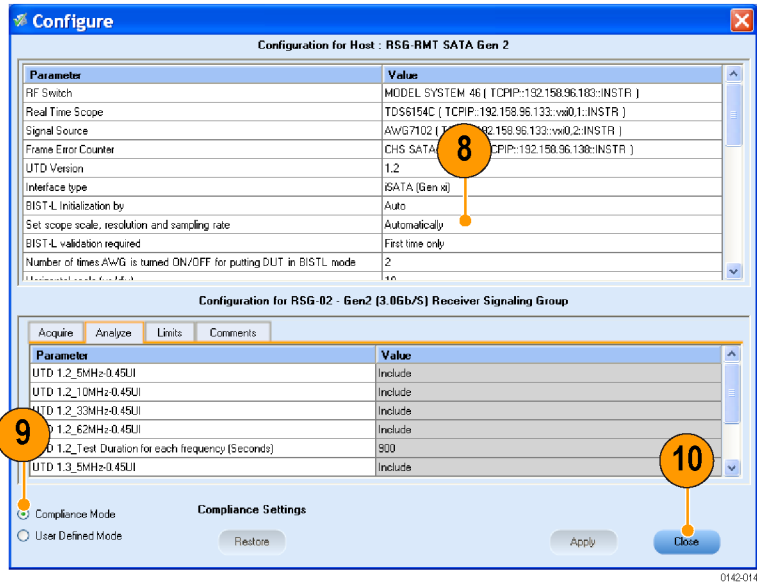
**NOTE.** RSG-02 - Gen2 (3.0 Gb/s) Receiver Signalling Group is a compliance test.

7. Click **Configure** if you want to configure the test parameters in the Configure panel.

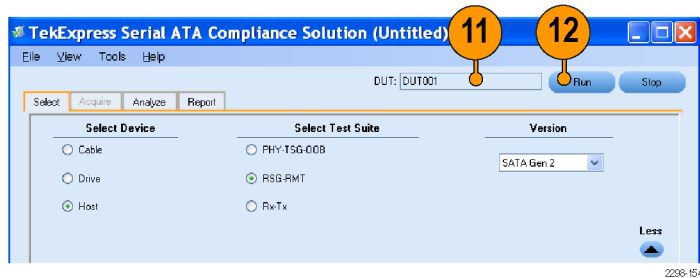


2298-031

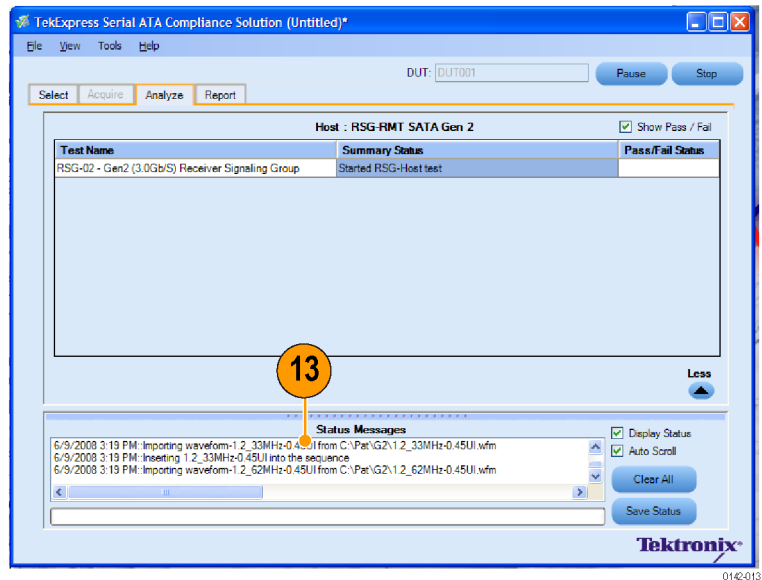
8. The parameters that are not grayed are editable. To change the instrument related values, select from the drop-down list for each of the parameters.
9. You can use the default values in the Compliance mode.
10. Click **Close**.



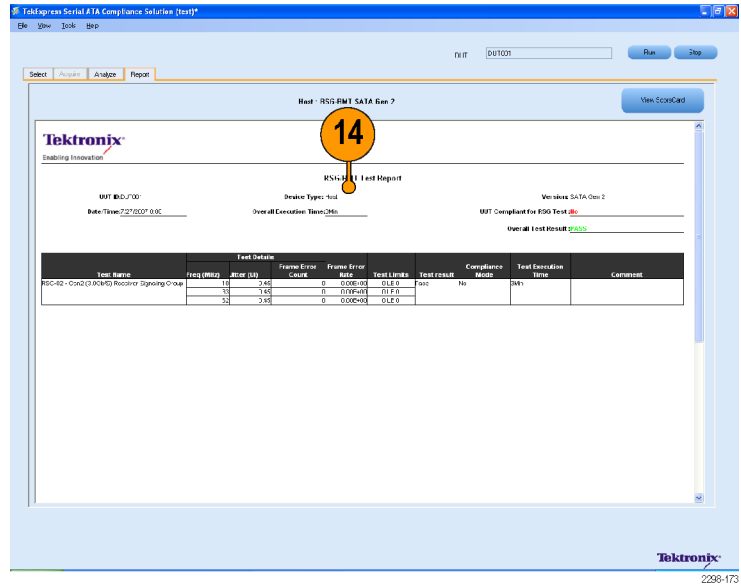
11. Enter the DUT ID in the DUT field.
12. Click **Run** to run the tests.



13. Observe that only **RSG-02 – Gen 2 (3.0 Gb/S) Receiver Signaling Group** is checked for compliance. Other tests are skipped. The status of the tests is displayed under **Status Messages** window.



14. After the test complete, a report appears in the **Report** panel.



## PHY-TSG-OOB Suite

The following equipment is required to set up the application:

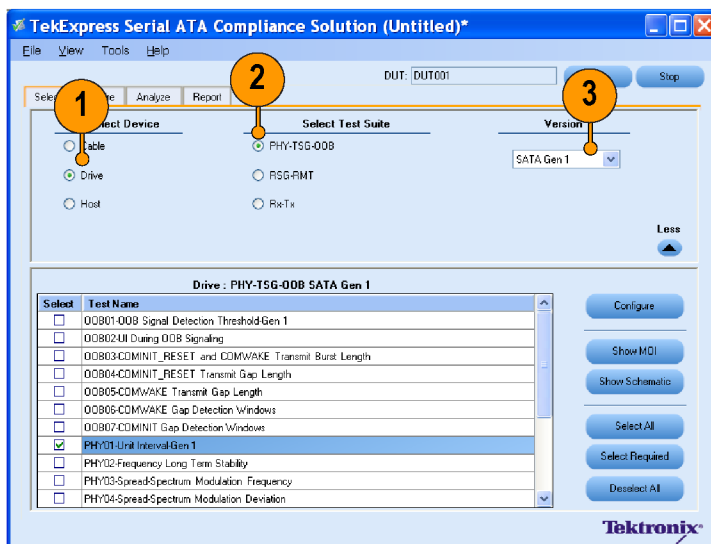
| <b>Resource</b>        | <b>Model supported</b>  |
|------------------------|---|
| Signal Source          | Tektronix AWG7102 (Option 6)  |
| Real Time Oscilloscope | <ul style="list-style-type: none"><li>■ Tektronix DPO/DSA72004/B, DPO/DSA71604/B, DPO/DSA71254/B, TDS6154C, and TDS6124C</li><li>■ For Gen1-only testing, the following oscilloscopes are also acceptable: DPO/DSA70804/B or TDS6804B</li></ul> |
| RF Switch              | Keithley S46-6666A (Optional)   |
| Test Fixture           | Crescent Heart Software Test Fixture TF-SATA-NE-ZP  |
| DUT                    | A SATA Drive to test  |



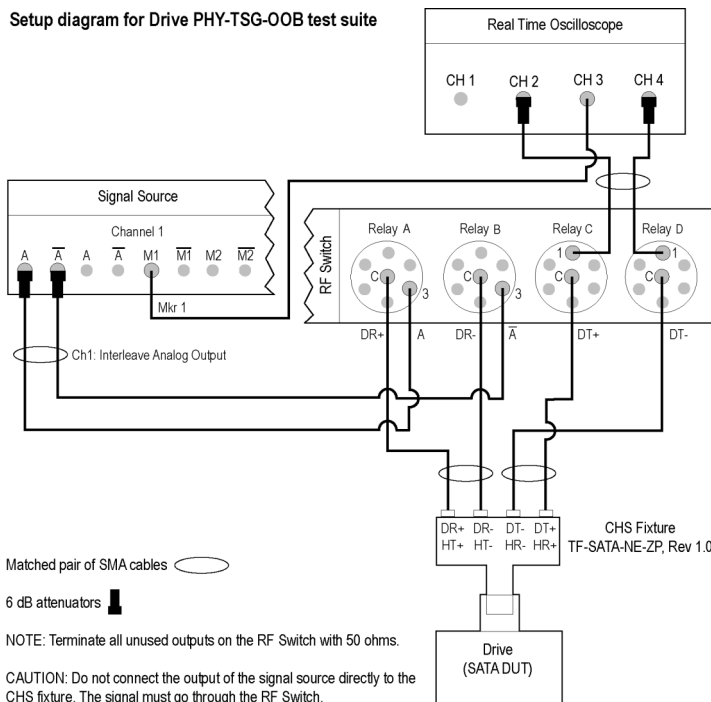
### Testing PHY01 - Unit Interval Test-Gen1 on a Drive

This test verifies that the Unit Interval of the SATA Drive transmitter is within the conformance limits.

1. Select **Drive** as the device type.
2. Select **PHY-TSG-OOB** as the test suite.
3. Select **SATA Gen 1** as the test suite version.



4. Connect the DUT to the equipment as shown in the setup diagram.



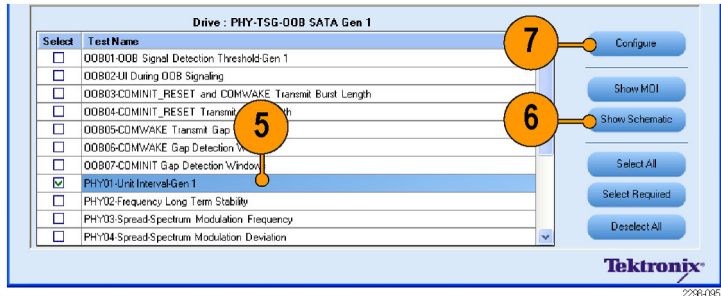
The CHS fixture notations in the schematic are with reference to Rev 1.0 of the fixture. If you are using fixtures before Rev 1.0, the fixture notations are in reverse order. For example, DT+/HR+ should be read as DR+/HT+.

If DUT Power Cycle sequence is automated using DC output of Signal Source, then do the following:  
 -Connect Channel-1 of DC output to pin #14 (and pin #15 to GND) in case of 20 pin Molex connector of AT/ATX power supply.  
 -Connect Channel-1 of DC output to pin #16 (and pin #17 to GND) in case of 24 pin Molex connector of AT/ATX power supply.

5. Select **PHY01 - Unit Interval Test - Gen 1**.

6. To verify the test setup before running the tests, click **Show Schematic**.

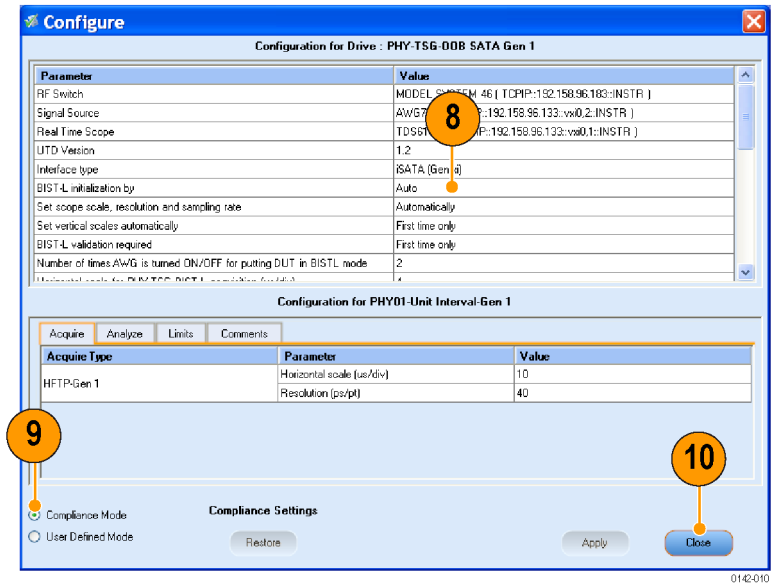
7. Click **Configure** if you want to configure the test parameters in the Configure panel.



8. The parameters that are not grayed are editable. To change the instrument related values, select from the drop-down list for each of the parameters.

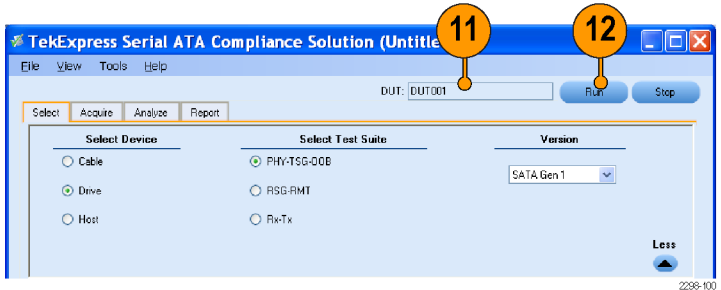
9. You can use the default values in the Compliance mode.

10. Click **Close**.

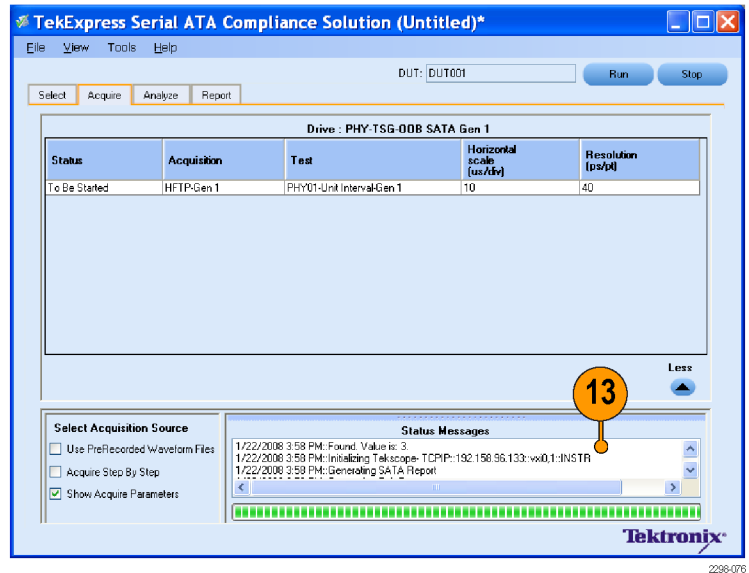


11. Enter the DUT ID in the DUT field.

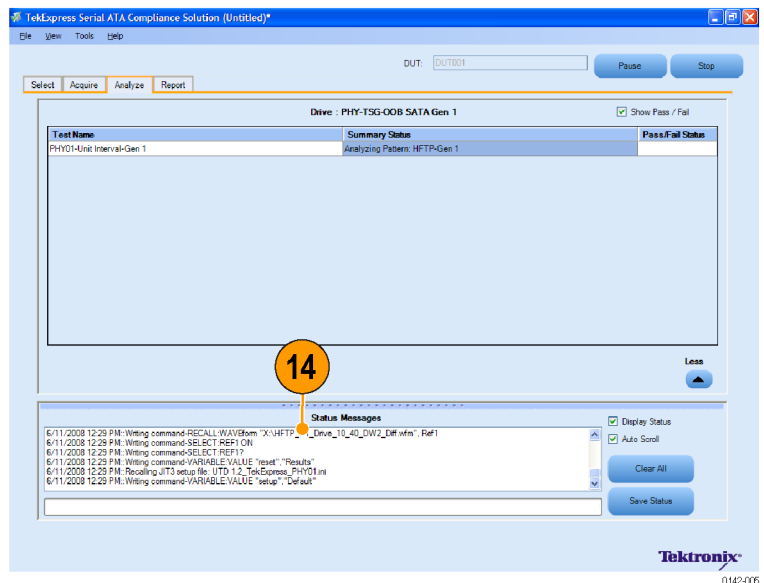
12. Click **Run** to run the tests.



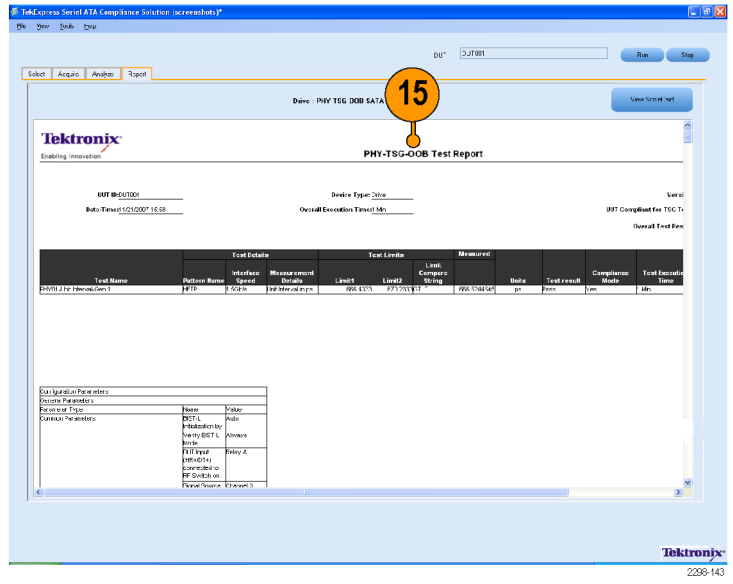
- The application automatically switches to the acquire panel. The status of the waveform acquisition is displayed in this panel.



- Observe that only **PHY01 - Unit Interval Test-Gen1** is checked for compliance. Other tests are skipped. The status of the tests is displayed under **Status Messages** window.



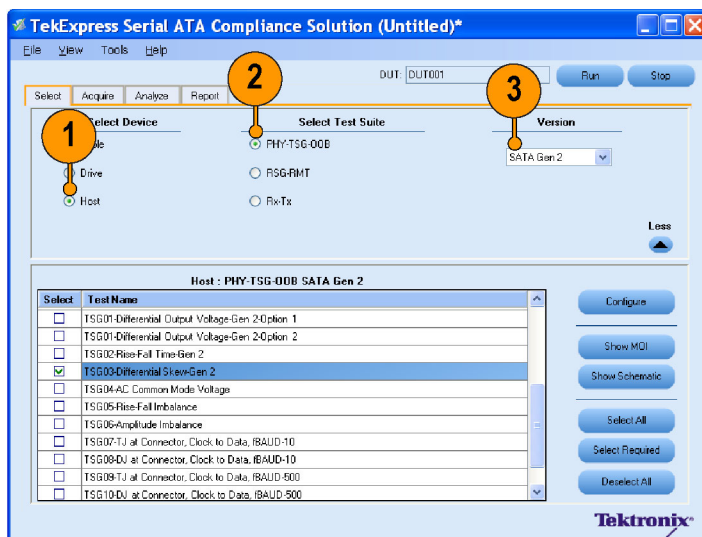
- When the tests run successfully, a report appears in the **Report** panel.



### Testing TSG03 - Differential Skew-Gen 2 on a Host

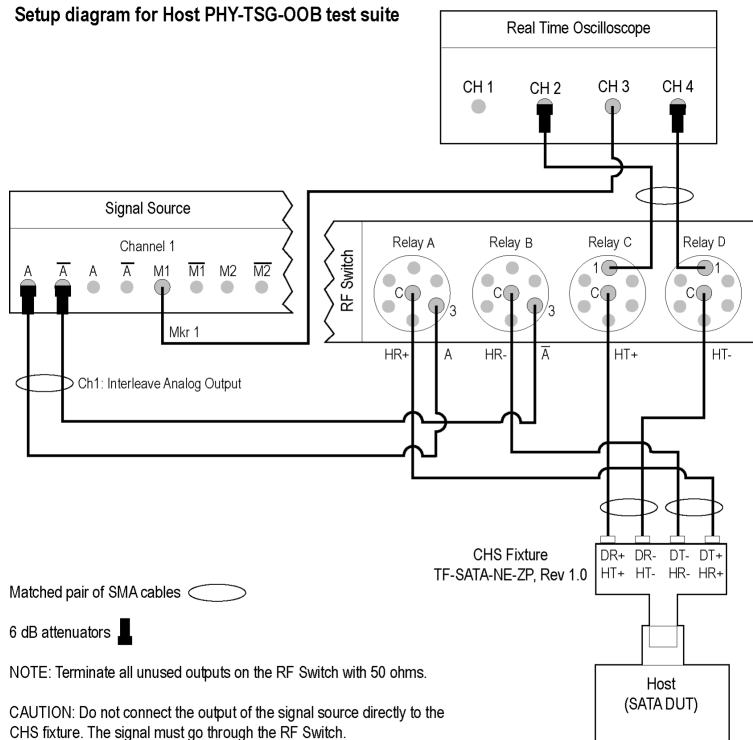
This test verifies that the differential skew of the SATA Host transmitter is within the conformance limits.

1. Select **Host** as the device type.
2. Select **PHY-TSG-OOB** as the test suite.
3. Select **SATA Gen 2** as the test suite version.



4. Connect the DUT to the equipment as shown in the setup diagram.

Setup diagram for Host PHY-TSG-OOB test suite



Matched pair of SMA cables

6 dB attenuators

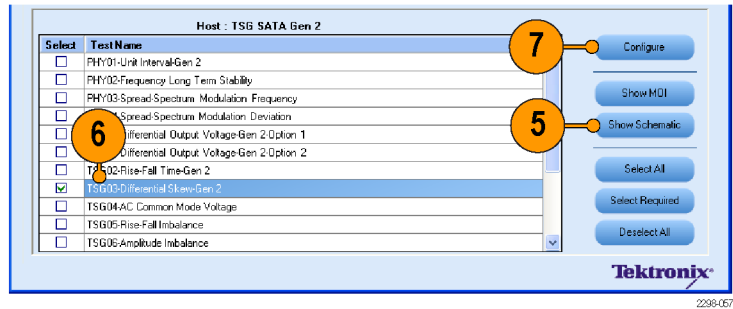
NOTE: Terminate all unused outputs on the RF Switch with 50 ohms.

CAUTION: Do not connect the output of the signal source directly to the CHS fixture. The signal must go through the RF Switch.

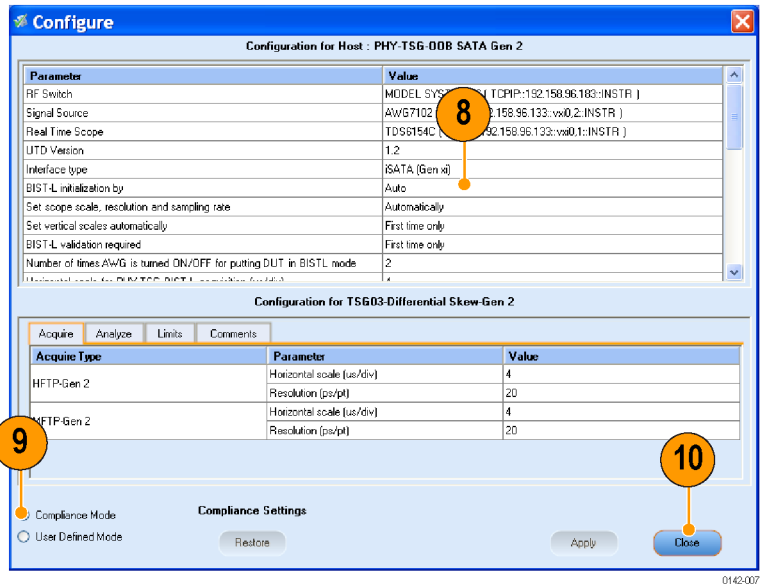
The CHS fixture notations in the schematic are with reference to Rev 1.0 of the fixture. If you are using fixtures before Rev 1.0, the fixture notations are in reverse order. For example, DT+/HR+ should be read as DR+/HT+.

If DUT Power Cycle sequence is automated using DC output of Signal Source, then do the following:  
 -Connect Channel-1 of DC output to pin #14 (and pin #15 to GND) in case of 20 pin Molex connector of AT/ATX power supply.  
 -Connect Channel-1 of DC output to pin #16 (and pin #17 to GND) in case of 24 pin Molex connector of AT/ATX power supply.

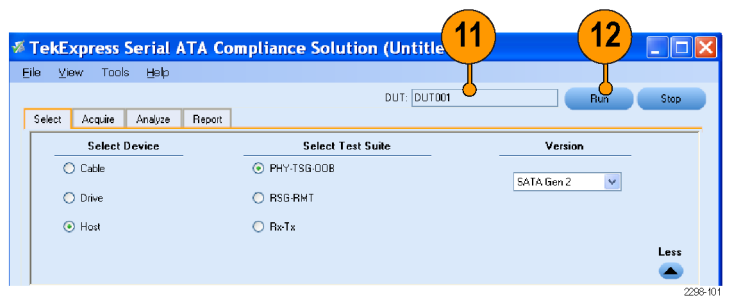
5. To verify the test setup before running the tests, click **Show Schematic**.
6. Select **TSG03 - Differential Skew-Gen 2**.
7. Click **Configure** if you want to configure the test parameters in the Configure panel.



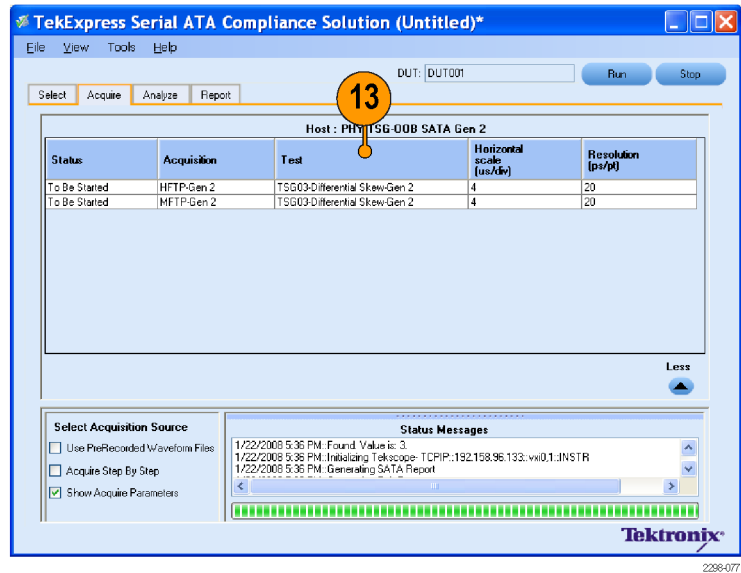
8. The general parameters that are not grayed are editable. To change the instrument related values, select from the drop-down list for each of the parameters.
9. You can use the default values in the Compliance mode.
10. Click **Close**.



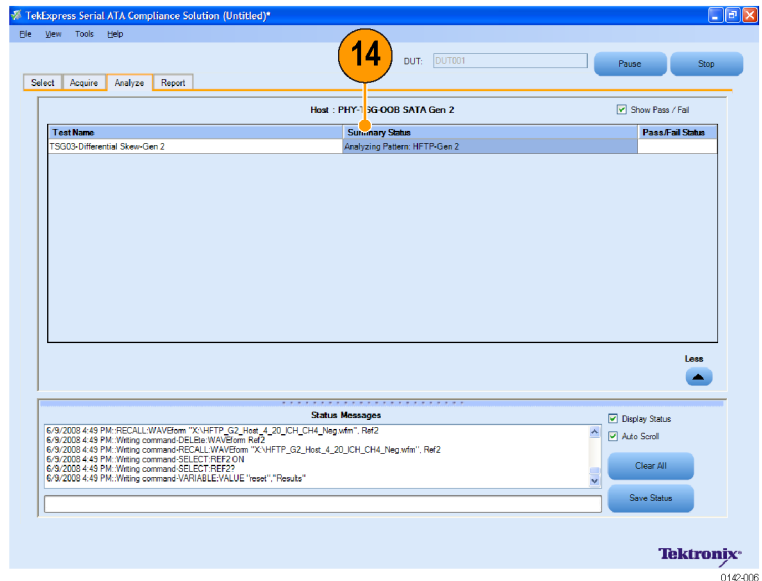
11. Enter the DUT ID in the DUT field.
12. Click **Run** to run the tests.



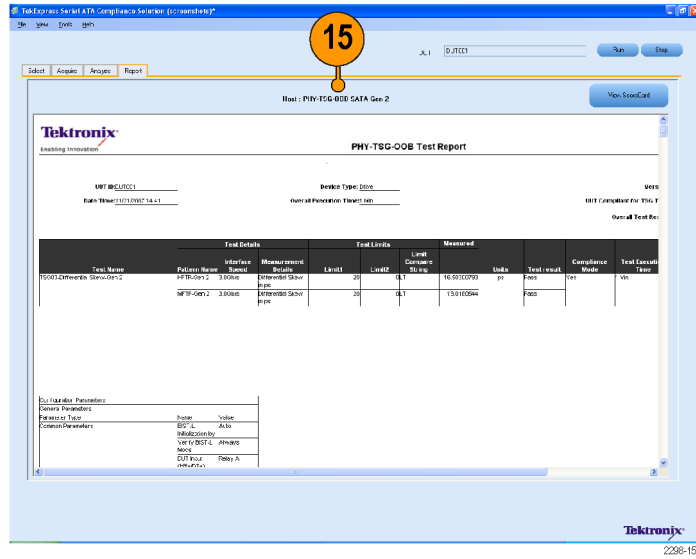
- Acquire panel showing the status of waveform acquisition.



- Observe that only **TSG03 - Differential Skew-Gen 2** is checked for compliance. Other tests are skipped. The status of the tests is displayed under **Status Messages** window.



- When the tests run successfully, a report appears in the **Report** panel.

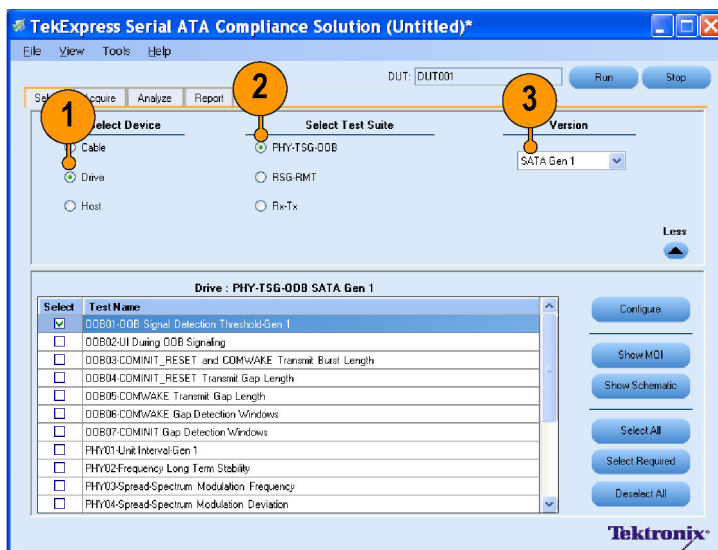




### Testing OOB01 - OOB Signal Detection Threshold-Gen1 on a Drive

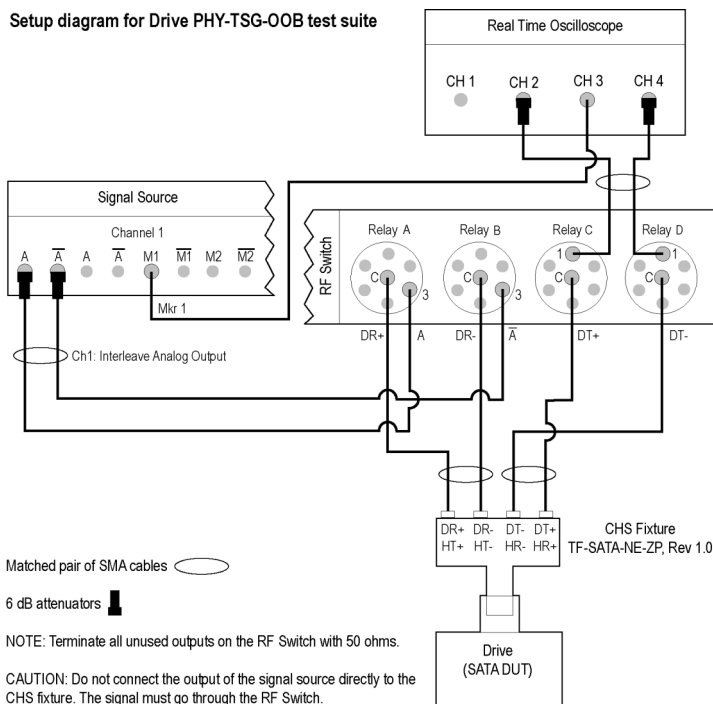
This test verifies that the OOB Signal Detection Threshold of the SATA Drive receiver is within the conformance limits.

1. Select **Drive** as the device type.
2. Select **PHY-TSG-OOB** as the test suite.
3. Select **SATA Gen 1** as the test suite version.



4. Connect the DUT to the equipment as shown in the setup diagram.

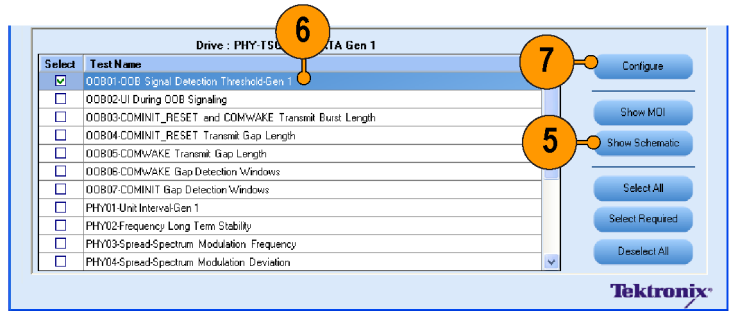
Setup diagram for Drive PHY-TSG-OOB test suite



The CHS fixture notations in the schematic are with reference to Rev 1.0 of the fixture. If you are using fixtures before Rev 1.0, the fixture notations are in reverse order. For example, DT+/HR+ should be read as DR+/HT+.

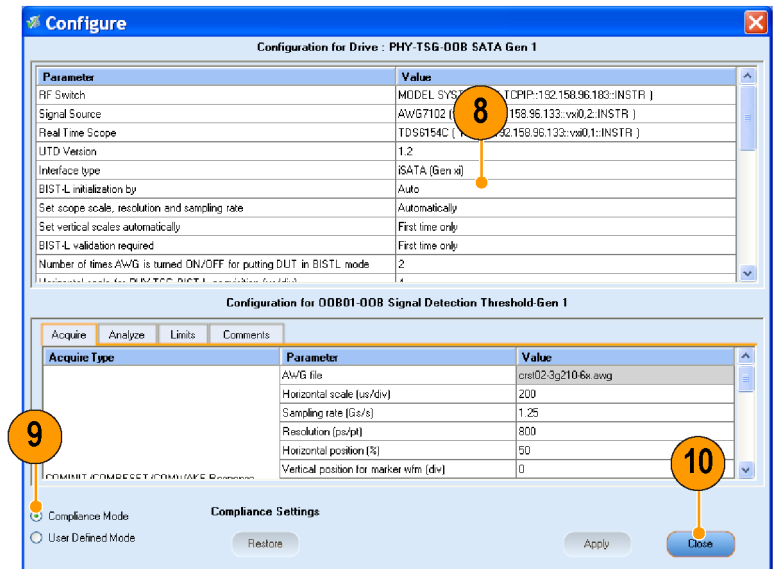
If DUT Power Cycle sequence is automated using DC output of Signal Source, then do the following:  
 -Connect Channel-1 of DC output to pin #14 (and pin #15 to GND) in case of 20 pin Molex connector of AT/ATX power supply.  
 -Connect Channel-1 of DC output to pin #16 (and pin #17 to GND) in case of 24 pin Molex connector of AT/ATX power supply.

5. To verify the test setup before running the tests, click **Show Schematic**.
6. Select **OOB01 - OOB Signal Detection Threshold-Gen1**.
7. Click **Configure** if you want to configure the test parameters in the Configure panel.



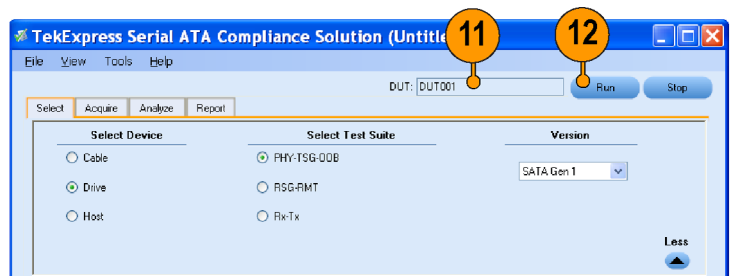
2298-142

8. The general parameters that are not grayed are editable. To change the instrument related values, select from the drop-down list for each of the parameters.
9. You can use the default values in the Compliance mode.
10. Click **Close**.



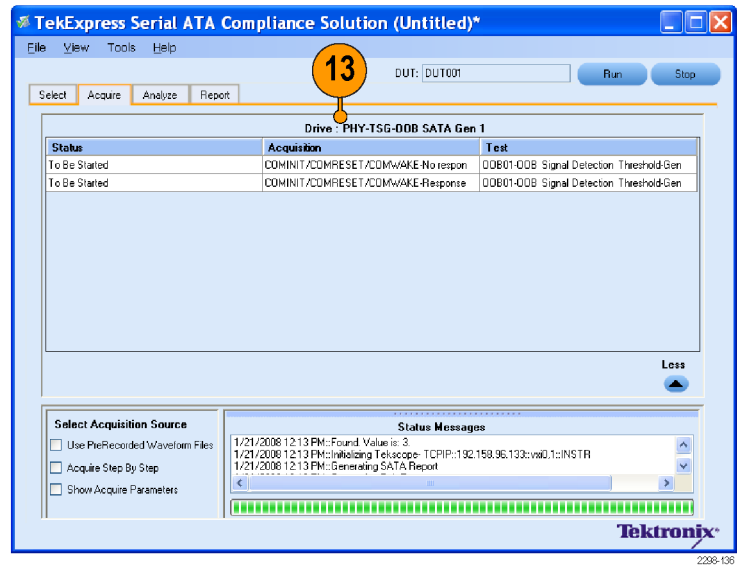
0142-008

11. Enter the DUT ID in the DUT field.
12. Click **Run** to run the tests.

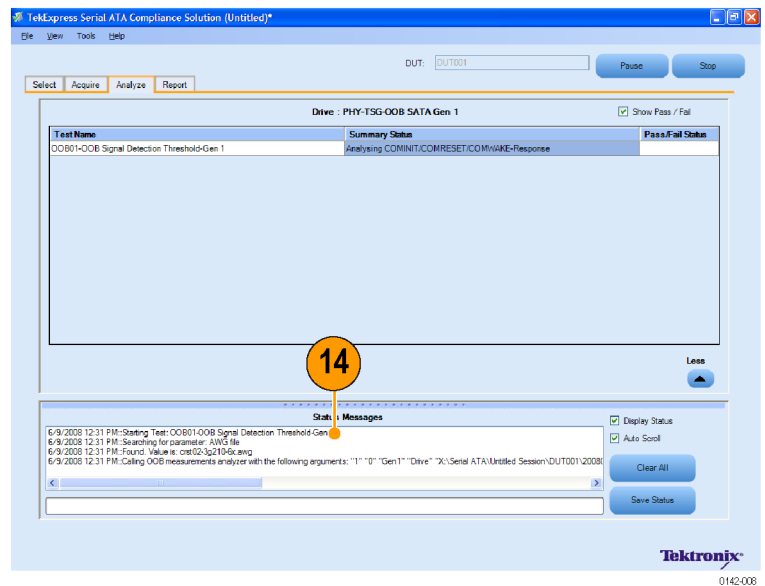


2298-141

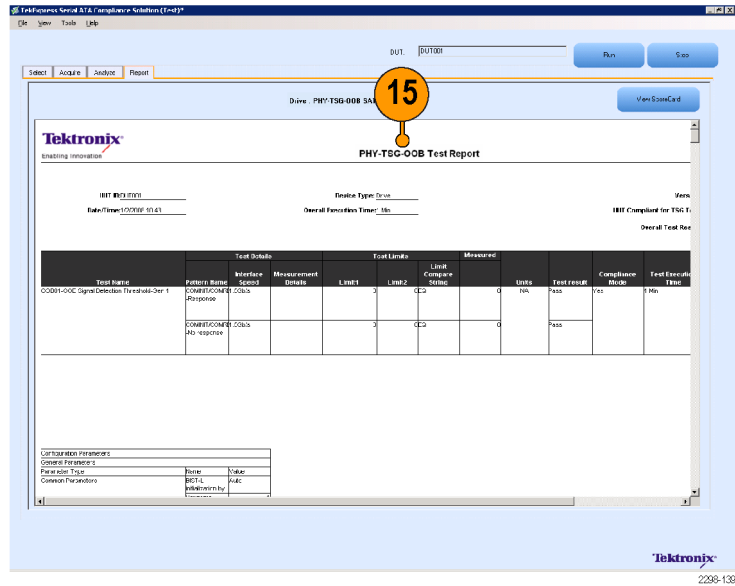
- Acquire panel showing the status of waveform acquisition.



- Observe that only **OOB01 - OOB Signal Detection Threshold-Gen1** is checked for compliance. Other tests are skipped. The status of the tests is displayed under **Status Messages** window.



- When the tests run successfully, a report appears in the **Report** panel.



## Rx-Tx Suite

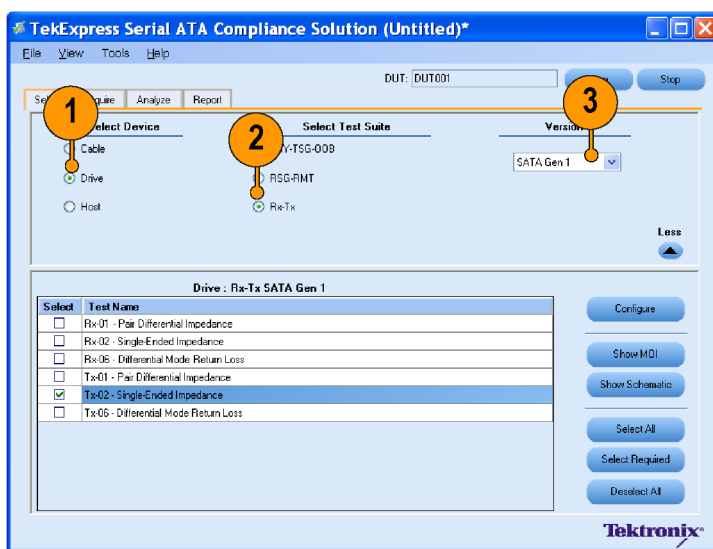
The following equipment is required to set up the application:

| Resource              | Model supported   |
|-----------------------|---|
| Signal Source         | Tektronix AWG7102 (Option 6)  |
| Sampling Oscilloscope | Tektronix CSA/TDS/DSA 8200 with two 80E04 modules   |
| RF Switch             | Keithley S46-6666A (Optional)   |
| Test Fixture          | Crescent Heart Software Fixture TF-SATA-NE-ZP   |
| SMA Cables            | <ul style="list-style-type: none"> <li>■ Five pairs of matched SMA Cables – 179-4944-00 or equivalent</li> <li>■ One SMA cable to connect to trigger input</li> <li>■ One SMA barrel adapter</li> </ul> |
| DUT                   | A SATA Drive to test  |

### Testing TX02 - Single-Ended Impedance on a Drive

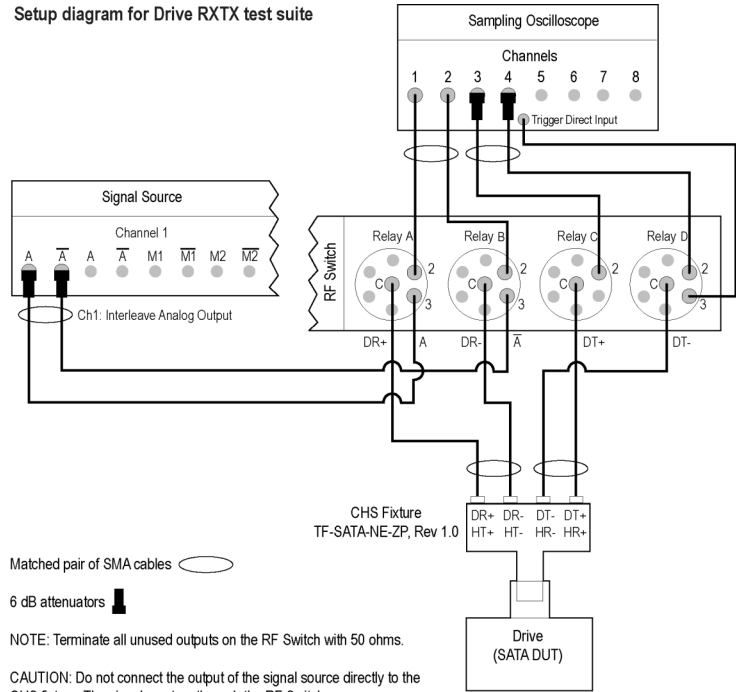
This test verifies that the Single-Ended impedance of a SATA drive transmitter is within the conformance limits.

1. Select **Drive** as the device type.
2. Select **RX-TX** as the test suite.
3. Select **SATA Gen 1** as the test suite version.



4. Connect the DUT to the equipment as shown in the setup diagram.

Setup diagram for Drive RXTX test suite



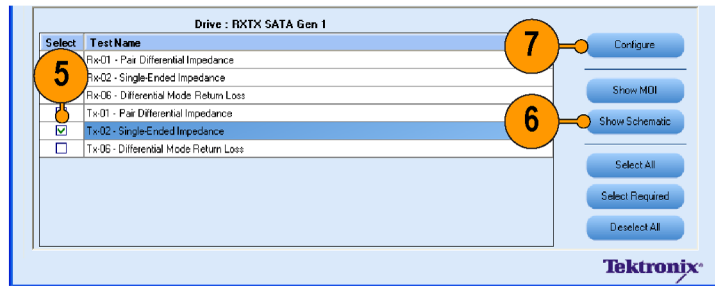
NOTE: Terminate all unused outputs on the RF Switch with 50 ohms.

CAUTION: Do not connect the output of the signal source directly to the CHS fixture. The signal must go through the RF Switch.

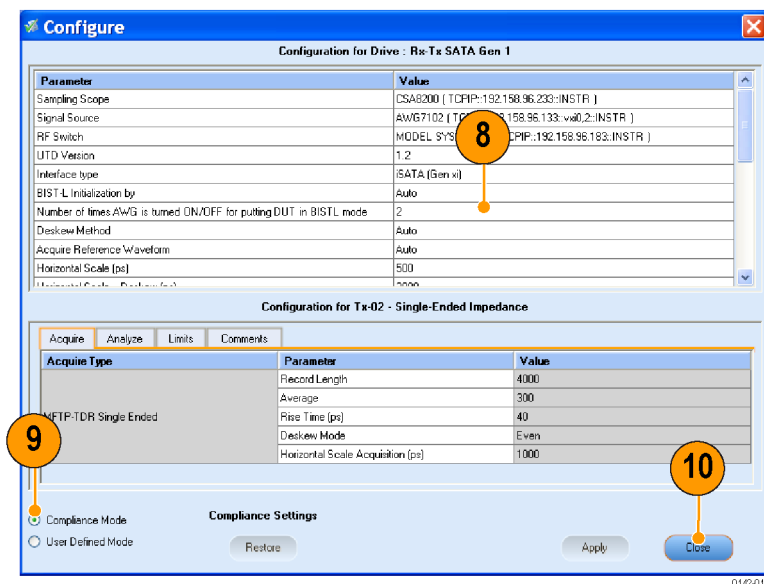
The CHS fixture notations in the schematic are with reference to Rev 1.0 of the fixture. If you are using fixtures before Rev 1.0, the fixture notations are in reverse order. For example, DT+/HR+ should be read as DR+/HT+.

If DUT Power Cycle sequence is automated using DC output of Signal Source, then do the following:  
 -Connect Channel-1 of DC output to pin #14 (and pin #15 to GND) in case of 20 pin Molex connector of AT/ATX power supply.  
 -Connect Channel-1 of DC output to pin #16 (and pin #17 to GND) in case of 24 pin Molex connector of AT/ATX power supply.

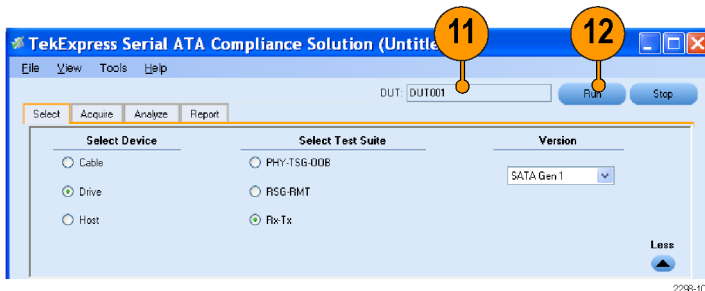
5. Select TX02 - Single-Ended Impedance
6. To verify the test setup before running the tests, click **Show Schematic**.
7. Click **Configure** if you want to configure the test parameters in the Configure panel.



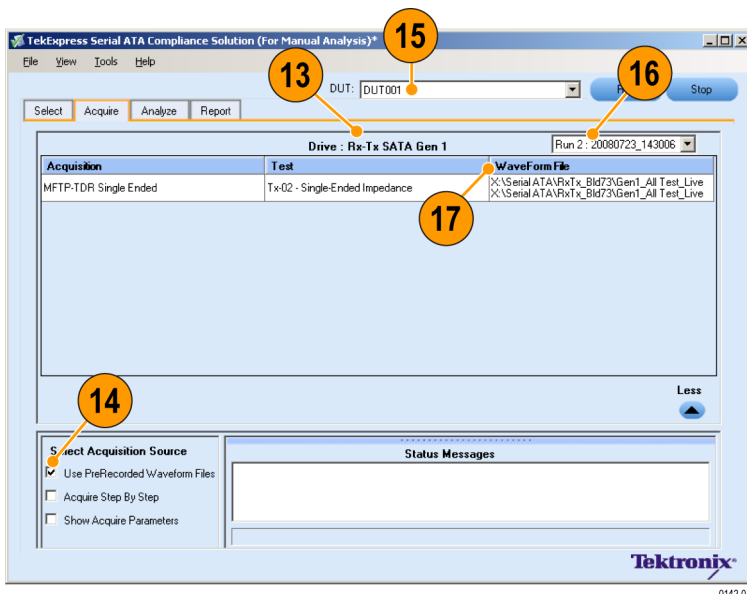
8. The parameters that are not grayed are editable. To change the instrument related values, select from the drop-down list for each of the parameters.
9. You can use the default values in the Compliance mode.
10. Click **Close**.



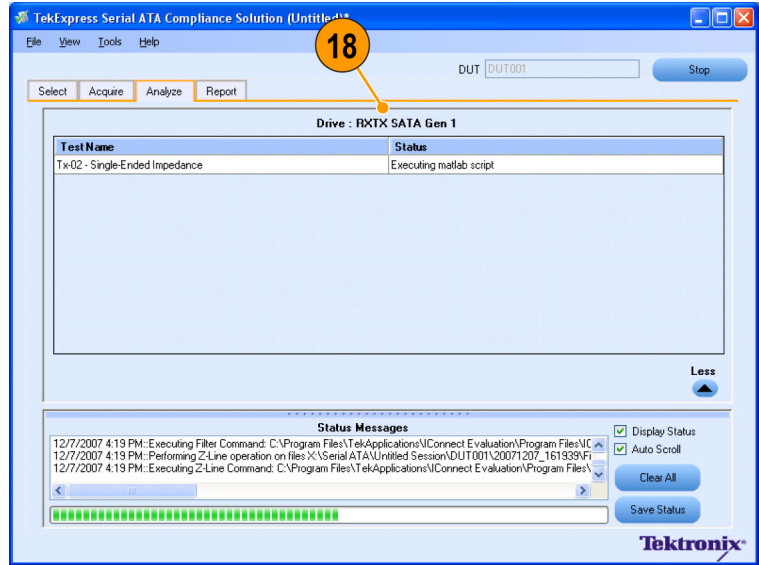
11. Enter the DUT ID in the DUT field.
12. Click **Run** to run the tests.



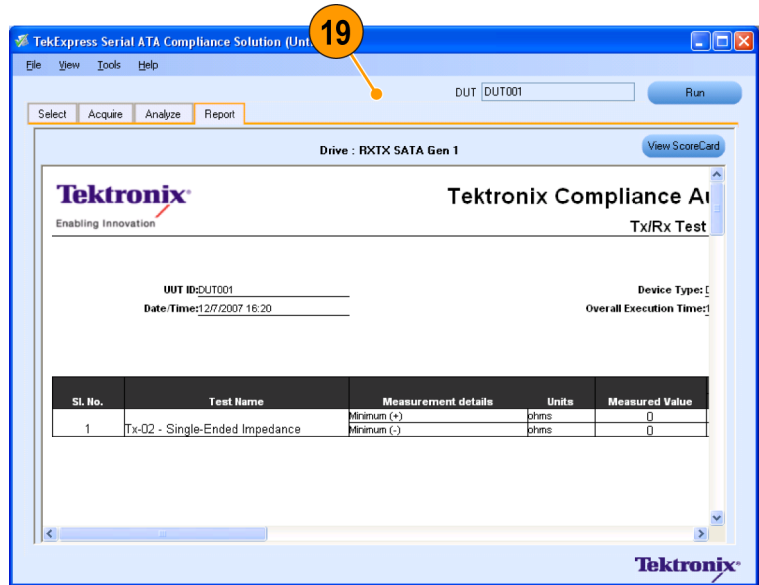
13. Acquire panel showing the status of waveform acquisition.
14. If you have selected the option **Use PreRecorded Waveform Files** before clicking Run, you need to browse the desired waveform file from the location where it exists.
15. If you had saved a session previously, you can select the DUT ID from the drop-down list.
16. You can select the require Run and the corresponding data in that Run will get populated. For example, the test selected in that run, the test configuration settings, the test summary status and so on.
17. The path showing the location of the sample waveform.



- Observe that only **TX02 - Single-Ended Impedance** is checked for compliance. Other tests are skipped. The status of the tests is displayed under **Status Messages** window.



- When the tests run successfully, a report appears in the **Report** panel.





## SI Suite

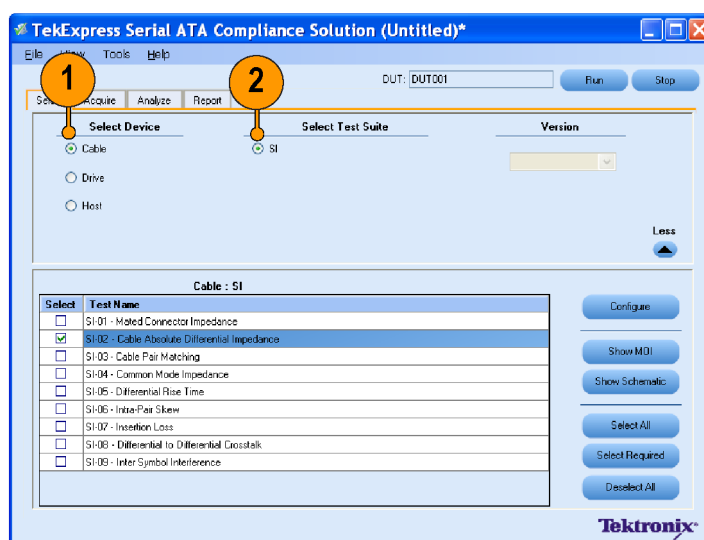
### Testing SI-02 - Cable Absolute Differential Impedance on a SATA Cable

The following equipment is required to set up the application:

| Resource              | Model supported   |
|-----------------------|---|
| Sampling Oscilloscope | Tektronix CSA/DSA/TDS 8200 with four 80E04 modules  |
| Test Fixture          | Two Crescent Heart Software Fixture TF-SATA-FE-ZP   |
| SMA Cables            | <ul style="list-style-type: none"> <li>■ Four pairs of matched SMA Cables 179-4944-01 or equivalent</li> <li>■ Two SMA barrel adapters</li> </ul> |
| DUT                   | A SATA Cable to test  |

This test verifies that the cable absolute differential impedance is within the conformance limits.

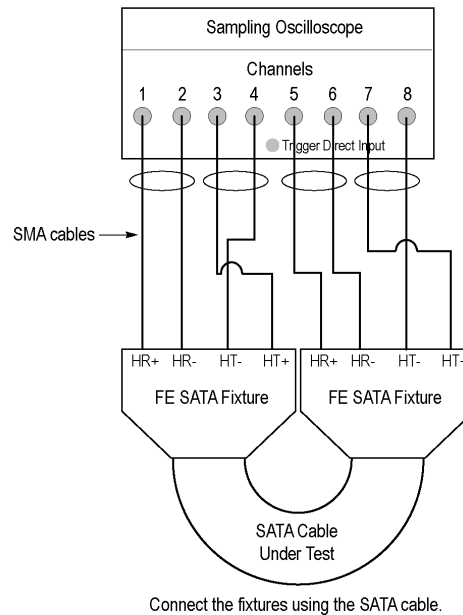
1. Select **Cable** as the device type.
2. Select **SI** as the test suite.




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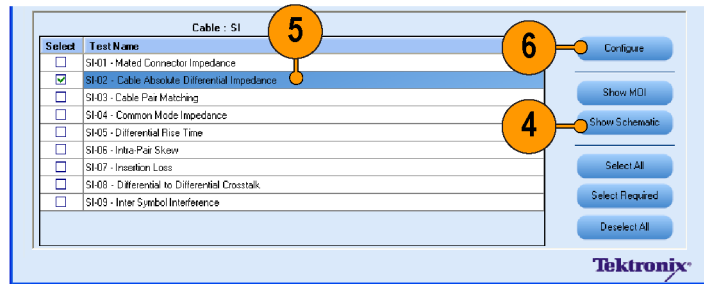
3. Connect the DUT to the equipment as shown in the setup diagram.

Setup diagram for Cable SI test suite

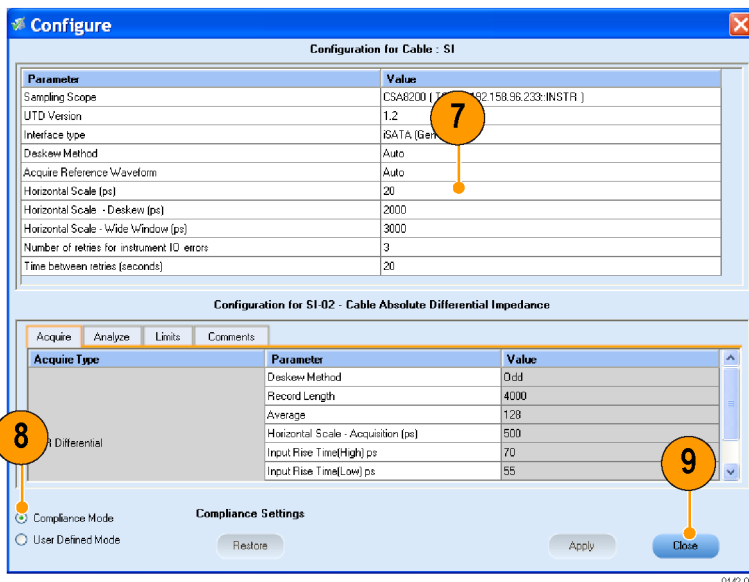


Matched pair of SMA cables 

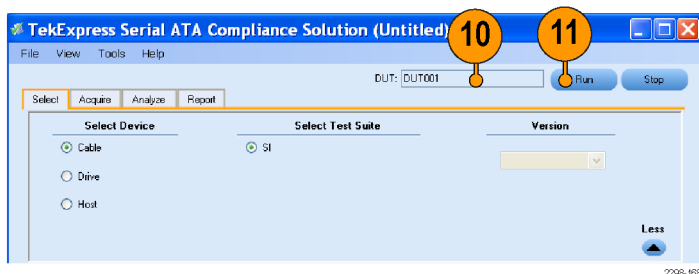
4. To verify the test setup before running the tests, click **Show Schematic**.
5. Select **SI-02 - Cable Absolute Differential Impedance**.
6. Click **Configure** if you want to configure the test parameters in the Configure panel.



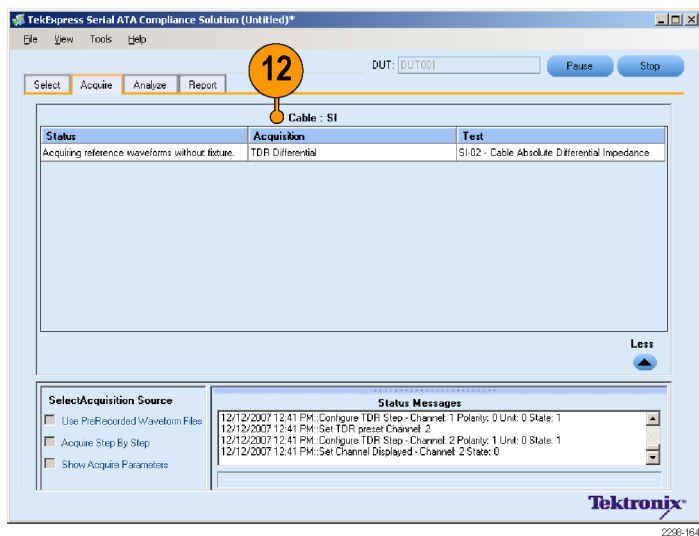
7. The parameters that are not grayed are editable. To change the instrument related values, select from the drop-down list for each of the parameters.
8. You can use the default values in the Compliance mode.
9. Click **Close**.



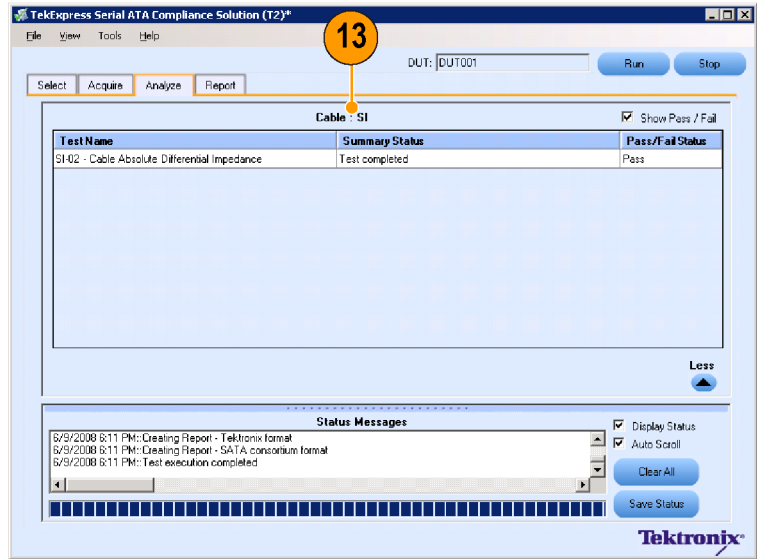
10. Enter the DUT ID in the DUT field.
11. Click **Run** to run the tests.



12. Acquire panel showing the status of waveform acquisition.

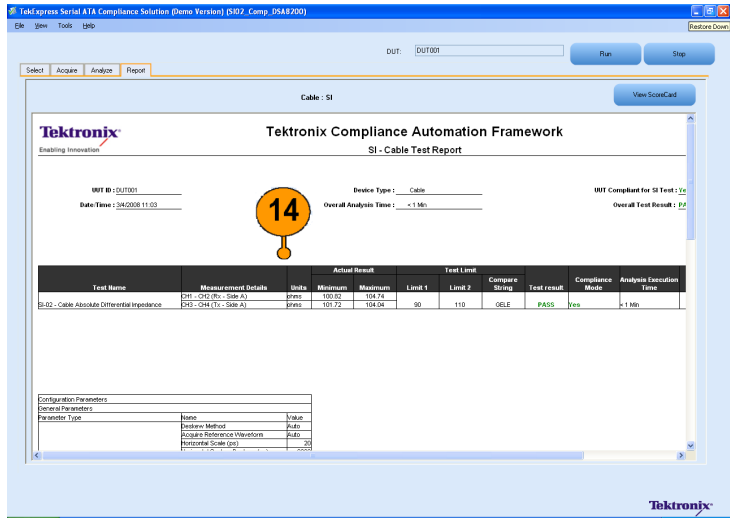


- Observe that only **SI-02 - Cable Absolute Differential Impedance** is checked for compliance. Other tests are skipped. The status of the tests is displayed in **Status Messages** window.



0142-017

- After the tests complete, a report appears in the **Report** panel.



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