



**TekExpress® Automotive PAM3 Analysis Application
Printable Application Help**





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Printable Application Help**

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

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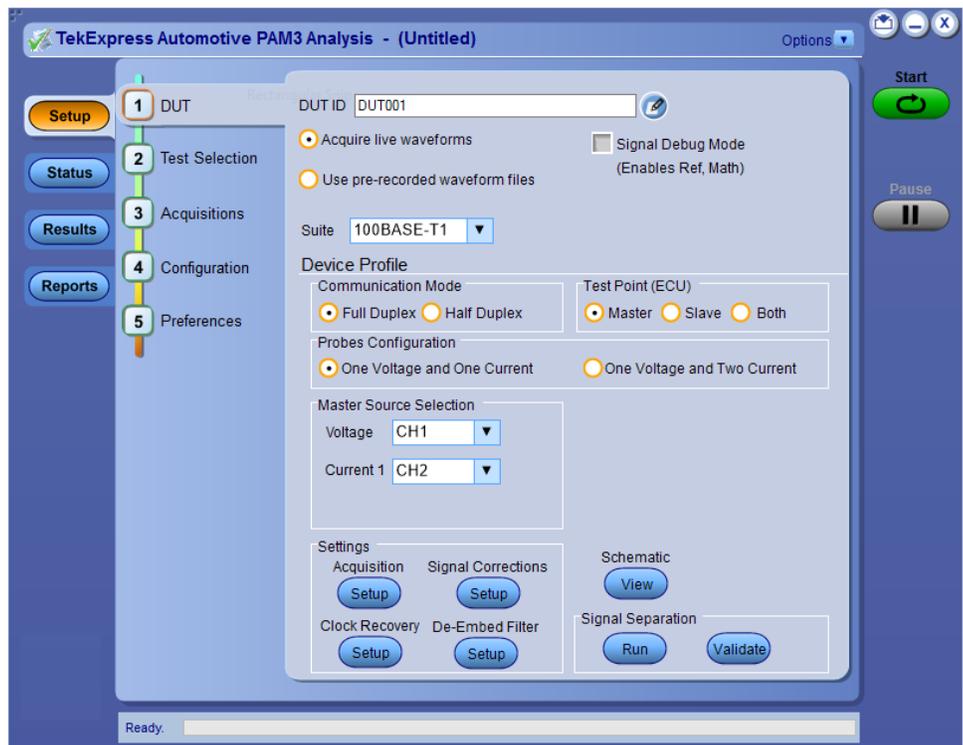
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Welcome

Welcome to TekExpress® Automotive PAM3 Analysis software application. Automotive Ethernet operates as a full-duplex communication link over a twisted-pair cable. The Full-Duplex communication, along with PAM3 signaling, adds complexity in validating the Electronic Control Units (ECU) in real-world conditions. The TekExpress Automotive PAM3 Analysis application includes unique Signal Separation capability and Electrical analysis.

The application enables you to separate traffic from two ECUs in full-duplex mode without having to cut cables or make hardware changes to the Ethernet cable using unique Signal Separation feature. The application provides more visibility into your Automotive PAM3 design with PAM3-based measurements including Eye Diagram, Bathtub Plot, and Jitter tests.



Key features

- Signal separation algorithm enables the analysis of a full duplex signal by separating them into their respective half duplex signals. The separation can be performed without affecting the ECU system or dissecting the Ethernet cable to install a directional coupler.
- Eye Diagram in noisy condition provides better insight compared to SQI (Signal Quality Index) value.
- The separated waveforms obtained from the signal separation algorithm enables you to decode both Master and Slave ECU signals simultaneously.
- Measurements like eye height and eye width can be used to measure the eye-opening of the signals. Additionally, an eye mask can be added to check the

shape of the eye-diagrams. The jitter measurements include deterministic, random and total jitter. The total jitter measurement can be calculated at a particular Bit Error Rate (BER) to demonstrate the signal integrity of the system. All the measurements can be performed on both master and slave ECUs.

Getting help and support

Related documentation

The following manuals are available as part of the TekExpress Automotive PAM3 Analysis Solution documentation set.

Table 1: Product documentation

Item	Purpose	Location
Online Help	Application operation and User Interface help	
PDF of the Online Help	Printable version of the compiled help	 <p>PDF file that ships with TekExpress Automotive PAM3 Analysis solution (TekExpress-Automotive-PAM3-Solution-Software-Printable-Help-ENUS.pdf). You can download the PDF version of the manual from the Tektronix website. Part number: 077-1606-xx http://www.tek.com</p>

Conventions

Help uses the following conventions:

- The term "Application," and "Software" refers to the TekExpress Automotive PAM3 Analysis application.
- The term “DUT” is an abbreviation for Device Under Test.
- The term “select” is a generic term that applies to the two methods of choosing a screen item (button control, list item): using a mouse or using the touch screen.
- A Note identifies important information.

Table 2: 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. Contact Tektronix through mail, telephone, or the Web site, <http://www.tek.com>.

When you contact Tektronix Technical Support, please include the following information (be as specific as possible):

General information

- All instrument model numbers
- Hardware options, if any
- Modules used
- Your name, company, mailing address, phone number, FAX number
- Please indicate if you would like to be contacted by Tektronix about your suggestion or comments.

Application specific information

- Software version number
- Description of the problem such that technical support can duplicate the problem
- If possible, save the setup files for all the instruments used and the application
- If possible, save the TekExpress setup files, log.xml, *.TekX (session files and folders), and status messages text file
- If possible, save the waveform on which you are performing the measurement as a .wfm file

Getting started

Supported oscilloscopes

- 5 Series Mixed Signal Oscilloscope (MSO54, MSO56, MSO58)
- 6 Series Mixed Signal Oscilloscope (MSO64) with bandwidth 4 GHz and above
- Firmware Version: 1.24.9.x or above

Recommended probes

- 100BASE-T1** Voltage probe
- TDP1500
 - TDP3500
- Current probe
- TCP0030A
 - P6022
 - CT6

- 1000BASE-T1** Voltage probe
- TDP3500
- Current probe
- CT6

Downloading and installing the software

Complete the following steps to download and install the latest PAM3 application. See *Supported oscilloscopes* on page 5 for compatibility.

1. Go to www.tek.com.
2. Click **Downloads**. In the Downloads menu, select DOWNLOAD TYPE as Software and enter *PAM3* in the MODEL OR KEYWORD field and click **SEARCH**.

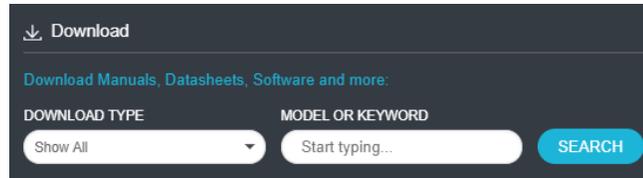


Figure 1: Download Manuals, Datasheets, Software and more

3. Select the latest version of software and follow the instructions to download. Copy the executable file to the oscilloscope.
4. Double-click the executable and follow the on-screen instructions. The software is installed at *C:\Program Files\Tektronix\TekExpress\TekExpress Automotive PAM3 Analysis*.
5. Select **Application > TekExpress Automotive PAM3 Analysis** from the oscilloscope Menu bar to launch the application.

Activate the license

Activate the license from the oscilloscope:

1. From the **Help** tab, select **About**.
2. Click **Install License**.

Browse to select the license file.

View software version

Use the following instruction to view version information for the application.

Click **Options > About TekExpress**.

Application directories

The TekExpress Automotive PAM3 Analysis files are installed at the following location:

C:\Program Files\Tektronix\TekExpress\TekExpress Automotive PAM3 Analysis

The application directory and associated files are organized as follows:

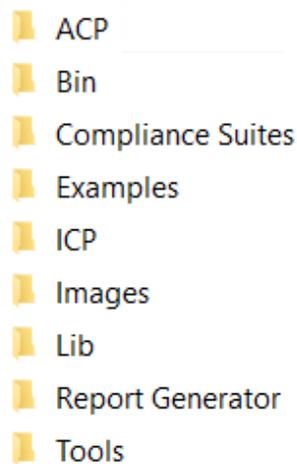


Figure 2: Application directory

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

Directory names	Usage
ACP	Contains application libraries
Bin	Contains dll files
Compliance Suites	Contains compliance specific files
Examples	Contains examples for SCPI commands
ICP	Contains instrument and application specific interface libraries
Images	Contains images of the application
Lib	Contains utility files specific to the application
Report Generator	Contains style sheets for report generation
Tools	Contains instrument and application specific files

File name extensions

The TekExpress Automotive PAM3 Analysis software uses the following file name extensions:

Table 3: File name extension

File name extension	Description
.TekX	Application session files (the extensions may not be displayed)
.py	Python sequence file
.xml	Test-specific configuration information (encrypted) files Application log files
.csv	Test result reports
.mht	Test result reports (default) Test reports can also be saved in HTML format
.pdf	Test result reports Application help document
.xslt	Style sheet used to generate reports

Operating basics

Launch the application

To launch the TekExpress Automotive PAM3 Analysis application, select **Applications > TekExpress Automotive PAM3 Analysis** from the oscilloscope Menu bar.

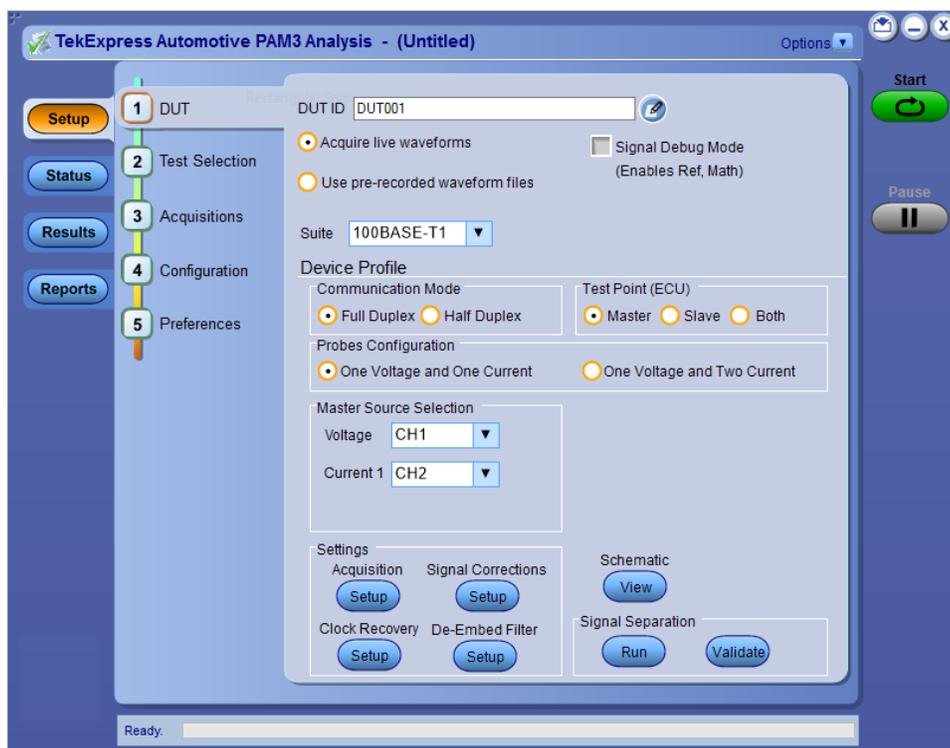


Figure 3: TekExpress Automotive PAM3 Analysis

After first launch of the TekExpress Automotive PAM3 Analysis application, the following changes take place on the oscilloscope.

During launch, a "My TekExpress" folder is created in the Documents folder of the current user and gets mapped to "X" drive. When the application is closed properly, the "X" drive will get unmapped.

NOTE. If a user with new login ID launches "TekExpress Automotive PAM3 Analysis.exe", the "My TekExpress" folder is created in the Documents folder of the new user.

When you first run the application after installation, the application checks for Resources.xml located in the X:\ folder. The Resources.xml file gets created in the X: drive. If the file is not found, then the application creates the file with equipment details. Session files are then stored inside the X:\TekExpress Automotive PAM3 Analysis folder. If this file is not found, the application runs an instrument discovery program to detect connected instruments before launching TekExpress Automotive PAM3 Analysis.

To keep the TekExpress Automotive PAM3 Analysis application window on top, select **Keep On Top** from the *Options menu*. If the application goes behind the oscilloscope application, click **Application > TekExpress Automotive PAM3 Analysis** to move the application to be in front.

NOTE. When **Keep on Top** is selected, you cannot access the combo boxes in the application panels.

See also

[Exit the application](#)

Exit the application

To exit the application, click  on the application title bar. Follow on-screen prompts to save any unsaved session, save test setup files, or exit the application.

NOTE. Using other methods to exit the application can result in abnormal termination of the application.

Application controls

This section describes the application controls.

Table 4: Application control description

Item	Description
<p><i>Options menu</i></p> 	<p>Menu to display global application controls.</p>
<p><i>Test panel</i></p> 	<p>Controls that open tabs for configuring test settings and options.</p>
<p>Start / Stop button</p>  	<p>Use the Start button to start the test run of the measurements in the selected order. If prior acquired measurements are not cleared, then new measurements are added to the existing set. The button toggles to the Stop mode while tests are running. Use the Stop button to abort the test.</p>
<p>Pause / Continue button</p> 	<p>Use the Pause button to pause the acquisition. When a test is paused, this button changes as Continue.</p>
<p>Clear button</p> 	<p>Use the Clear button to clear all existing measurement results. Adding or deleting a measurement, or changing a configuration parameter of an existing measurement, also clears measurements. This is to prevent the accumulation of measurement statistics or sets of statistics that are not coherent. This button is available only on the <i>Results panel</i>.</p> <p>NOTE. This button is visible only when there are results data on the panel.</p>

Item	Description
Application window move icon 	Place the cursor over the top of the application window to move the application window to the desired location
Minimize icon 	Minimizes the application.
Close icon 	Close the application.
Mini view / Normal view  	Toggles the application between mini view and normal view. Mini view displays the run messages with the time stamp, progress bar, Start / Stop button, and Pause / Continue button. The application moves to mini view when you click the Start button. 

Global application 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.

Options menu overview

To access the **Options** menu, click  in the upper-right corner of the application. It has the following selections:

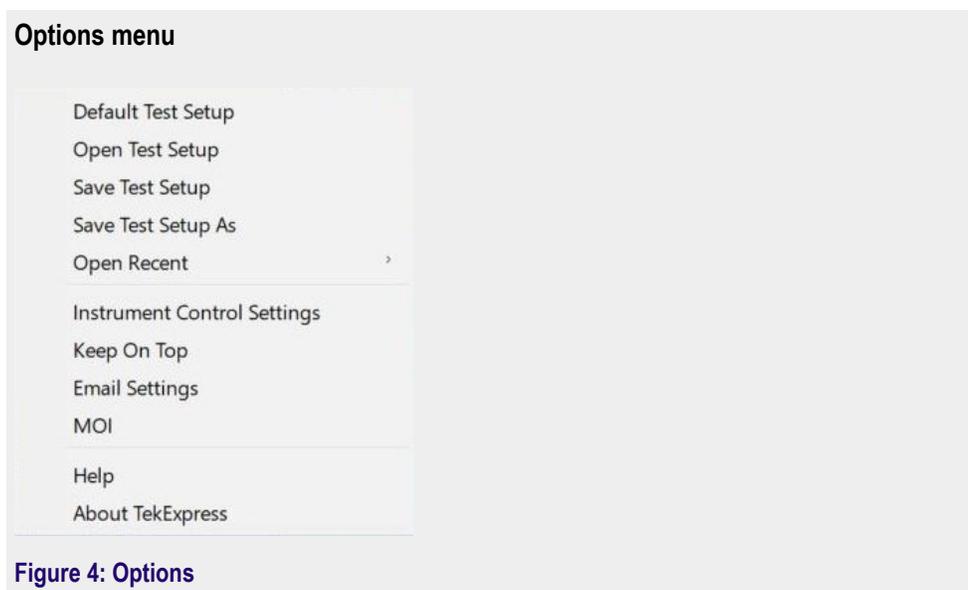


Figure 4: Options

Menu	Function
Default Test Setup	Opens an untitled test setup with defaults selected
Open Test Setup	Opens a saved test setup
Save Test Setup	Saves the current test setup
Save Test Setup As	Saves the current test setup with a different file name or file type
Open Recent	Displays the recently opened test setups to open
Instrument Control Settings	Detects, lists, and refreshes the connected instruments found on specified connections (LAN, GPIB, USB, and so on)
Keep On Top	Keeps the TekExpress Automotive PAM3 Analysis application on top of all the application <i>NOTE. When Keep on Top is selected, you cannot access the combo boxes in the application panels.</i>
Email Settings	Configures email options for test run and results notifications
MOI	Displays the TekExpress Automotive PAM3 Analysis MOI (Method Of Implementation) document

Menu	Function
Help	Displays the TekExpress Automotive PAM3 Analysis help
About TekExpress	<ul style="list-style-type: none"> ■ Displays application details such as software name, version number, and copyright ■ Provides a link to the end-user license agreement ■ Provides a link to the Tektronix Web site

See also. [Application controls](#)

TekExpress instrument control settings

Use the **TekExpress Instrument Control Settings** dialog box to search the instruments (resources) connected to the application. You can use the **Search Criteria** controls to search the connected instruments depending on the connection type. The details of the connected instrument is displayed in the Retrieved Instruments window.

To access, click **Options > Instrument Control Settings**.

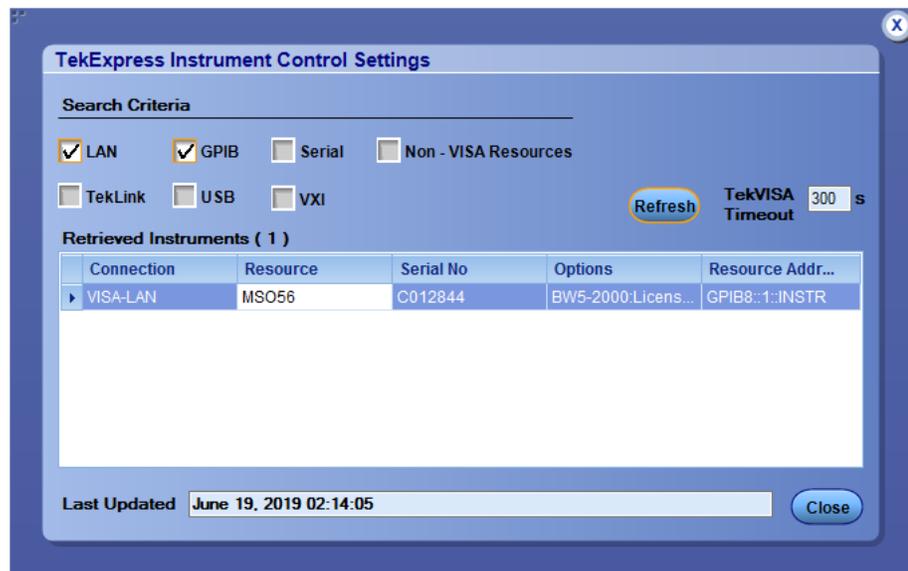


Figure 5: TekExpress Instrument Control Settings

The connected instruments displayed here can be selected for use under Global Settings in the test configuration section.

NOTE. Select **GPIB** (Default) and **LAN** when using TekExpress Automotive PAM3 Analysis application on 5/6 Series MSO instruments.

See also. [Options menu overview](#)

View connected instruments

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

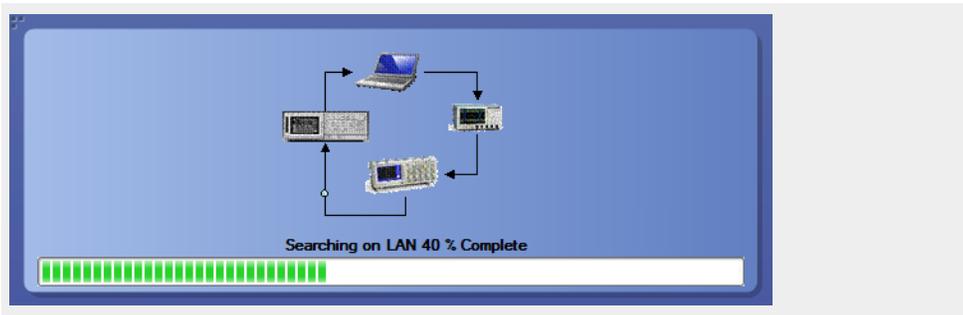
NOTE. *The instruments required for the test setup must be connected and be recognized by the application before running the test.*

To refresh the list of connected instruments:

1. From the **Options** menu, select **Instrument Control Settings**.
2. In the **Search Criteria** section of the Instrument Control Settings dialog box, select the connection types of the instruments to search.

Instrument search is based on the VISA layer, but different connections determine the resource type, such as LAN, GPIB, and USB. For example, if you choose LAN, the search will include all the instruments supported by TekExpress that are communicating over the LAN.

3. Click **Refresh**. TekExpress searches for connected instruments.



4. After searching, the dialog box lists the instrument-related details based on the search criteria. For example, for the Search Criteria as LAN and GPIB, the application displays all LAN and GPIB instruments connected to the application.

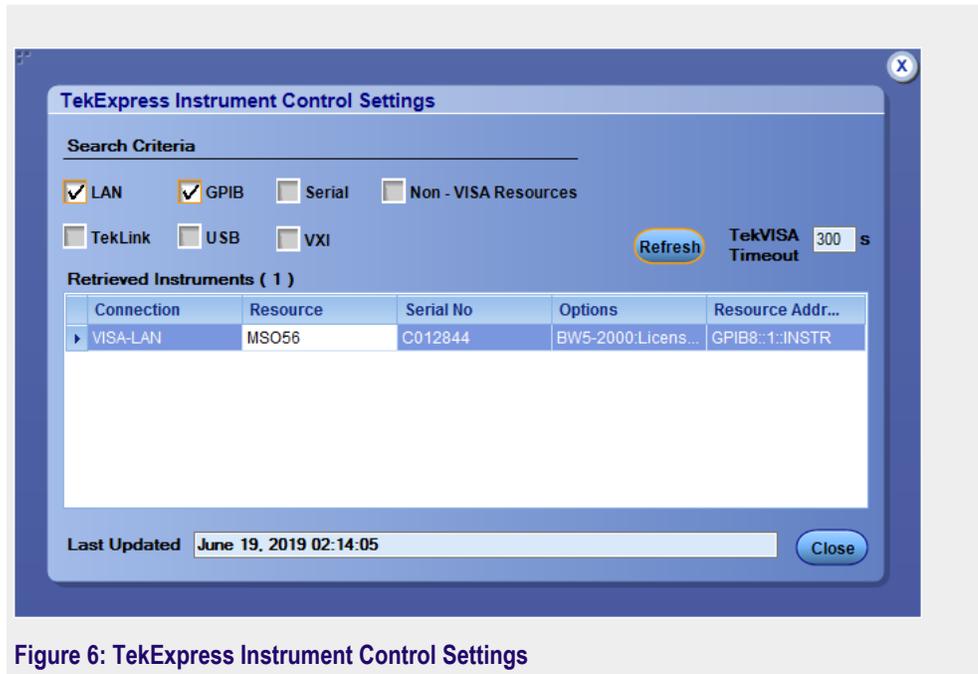


Figure 6: TekExpress Instrument Control Settings

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

See also. *Equipment connection diagram* on page 49

Configure email settings

Use the **Email Settings** utility to get notified by email when a measurement completes, or produces any error condition. Follow the steps to configure email settings:

Email Settings

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

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

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

5. In the **Email Attachments** section, select from the following options:
 - **Reports:** Select to receive the test report with the notification email.
 - **Status Log:** Select to receive the test status log with the notification email. If you select this option, then also select whether you want to receive the full log or just the last 20 lines.

6. In the **Email Configuration** section:
 - Enter a maximum file size for the email message. Messages with attachments larger than this limit will not be sent. The default is 5 MB.
 - Enter the number in the Number of Attempts to Send field, to limit the number of attempts that the system makes to send a notification. The default is 1. You can also specify a timeout period.
7. Select the **Email Test Results When complete or on error** check box. Use this check box to quickly enable or disable email notifications.
8. To test your email settings, click **Test Email**.
9. To apply your settings, click **Apply**.
10. Click **Close** when finished.

Application panels overview

The TekExpress Automotive PAM3 Analysis solution uses panels to group Test Setup Configuration, Results, and Reports settings. Click any button to open the associated panel. A panel may have one or more tabs that list the selections available in that panel. Controls in a tab can change depending on settings made in the same tab or another tab.

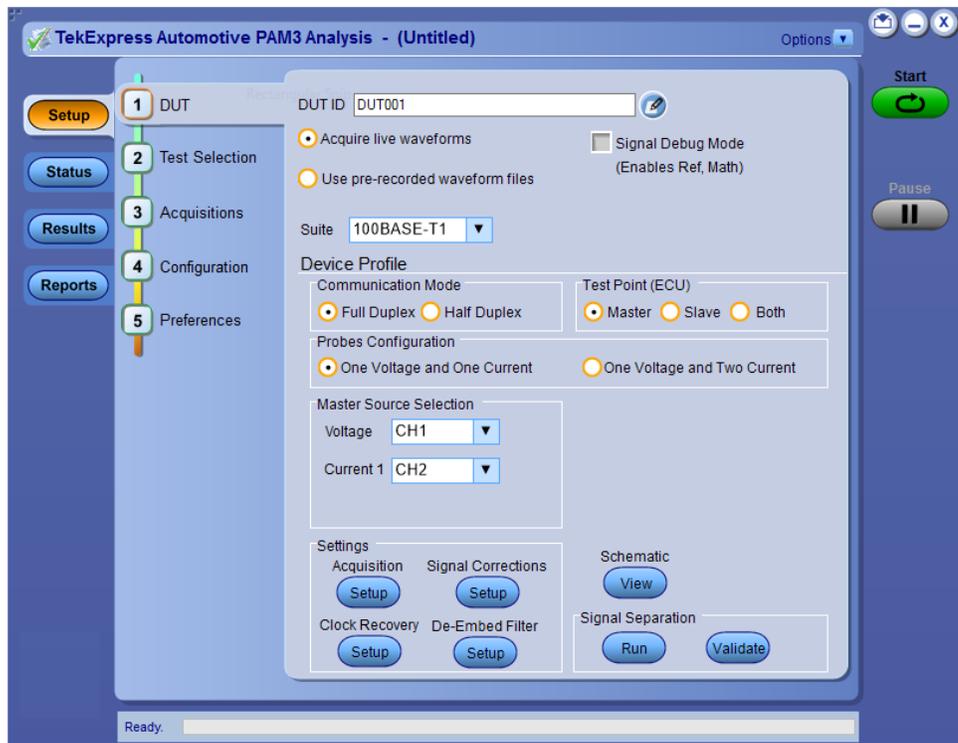


Figure 7: Application panels

Table 5: Application panels overview

Panel Name	Purpose
Setup panel	<p>The Setup panel shows the test setup controls. Click the Setup button to open this panel.</p> <p>Use this panel to:</p> <ul style="list-style-type: none"> ■ Set DUT tab parameters ■ Select tests ■ Set acquisition tab parameters ■ Set configuration tab parameters ■ Set preferences tab parameters
Status panel	View the progress and analysis status of the selected tests, and view test logs.
Results panel	View the summary of test results and select result viewing preferences.
Reports panel	Browse for reports, save reports as specific file types, specify report naming conventions, select report content to include (summary information, detailed information, user comments, setup configuration, application configuration, test point, signal mode, and eye sections etc.), and select report viewing options.

See also [Application controls](#)

Setup panel

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

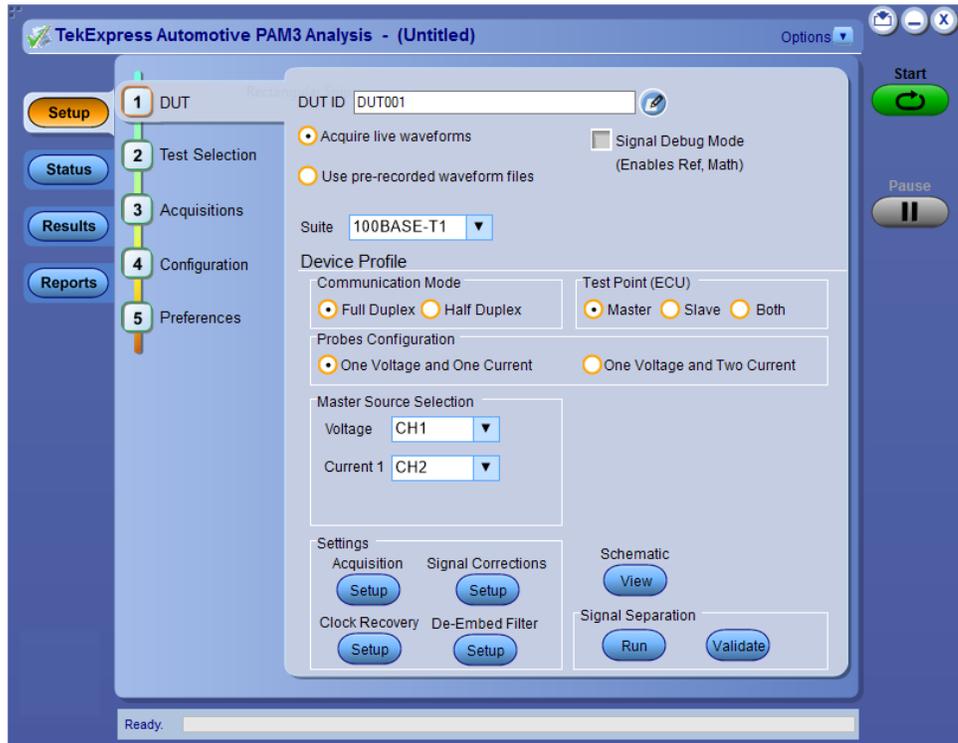


Figure 8: Setup panel

Set DUT parameters Use the **DUT** tab to select parameters for the device under test. These settings are global and apply to all tests of the current session.

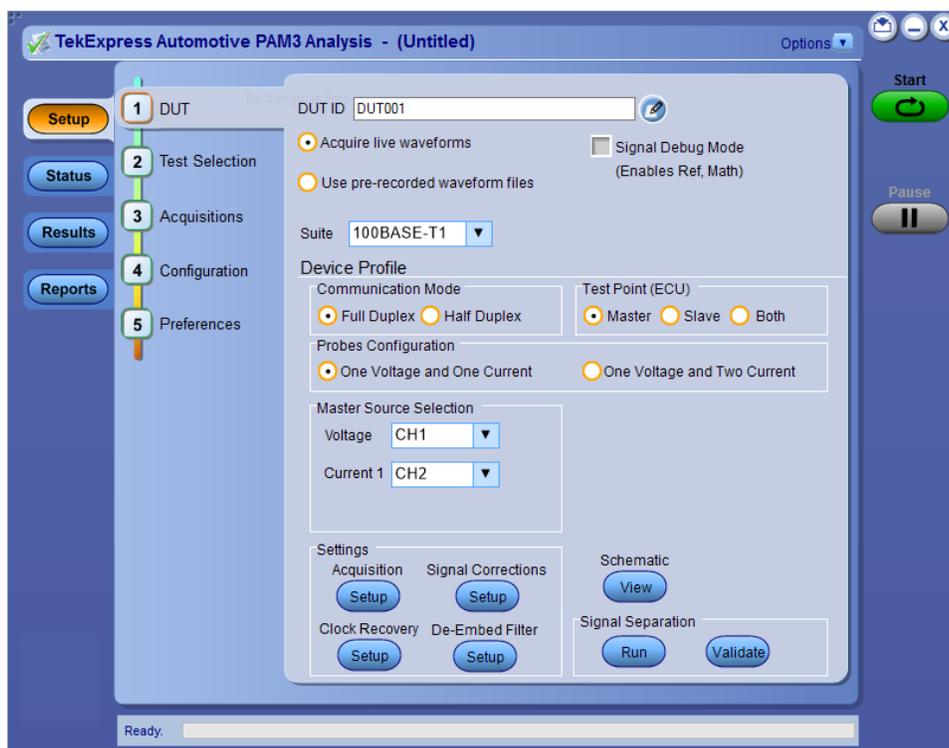


Figure 9: DUT tab

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

Table 6: DUT tab - DUT tab settings

Setting	Description
DUT ID	Adds an optional text label for the DUT to reports. The default value is DUT001. The maximum number of characters is 32. You cannot use the following characters in an ID name: (,.,,.,.,.,.,.,./,:? "<> *)
 Comments icon (to the right of the DUT ID field)	Opens the Comments dialog box to enter text to add to the report. Maximum size is 256 characters. To enable or disable comments appearing on the test report, see Select report options .
Acquire live waveforms	Acquires active signals from the DUT for measurement and analysis.
Use pre-recorded waveform files	Runs tests on a saved waveform. Open (load) a saved test setup .
Signal Debug Mode (Enables Ref, Math)	Selects to enable the Ref and Math for Master and Slave source selection and skip the acquisition. It will only analyze the waveforms.
Suite	Selects the preferred suite from the drop-down option. <ul style="list-style-type: none"> ■ 100BASE-T1 ■ 1000BASE-T1
Device Profile	

Setting	Description
Communication Mode	Selects the preferred communication mode. <ul style="list-style-type: none"> ■ Full Duplex ■ Half Duplex
Test Point (ECU)	Selects the preferred test point <ul style="list-style-type: none"> ■ Master ■ Slave ■ Both
Probes Configuration	Selects the preferred probe configuration. <ul style="list-style-type: none"> ■ One Voltage and One Current ■ One Voltage and Two Current
Master Source Selection	Selects the signal source for Voltage and Current signals from the drop-down option.
Slave Source Selection	Selects the signal source for Voltage and Current signals from the drop-down option.
Schematic	Displays the equipment connection setup based on the communication mode, test point, and the probes configuration selected.
Signal Separation	
Run	Run button separates the waveform from voltage and current signals.
Validate	Allows you to validate the signal separation before running all the tests. Displays  icon, which means that signal separation is In-Progress. It also allows you to validate the signal separation and provide clock recovered waveform to plot eye diagram.
Settings	
Acquisition	Displays the Acquisition setup pop-up window. Allows you to set the horizontal and signal separation settings.
Signal Corrections	Displays the Signal Correction setup pop-up window. Allows you to set the skew and attenuation settings, and also allows you to apply the correction files.
Clock Recovery	Displays the Clock Recovery setup pop-up window. Allows you to set the Baud Mode and PLL (Phase Locked Loop) settings.
De-Embed Filter	Displays the De-Embed filter setup pop-up window. Allows you to create and apply the CTLE Filter files and Inverse PR (Partial Response) Shaping filter files. <hr/> NOTE. Inverse PR Shaping filter is applicable only for 1000BASE-T1. <hr/>

The following parameters are applicable for acquisition setup:

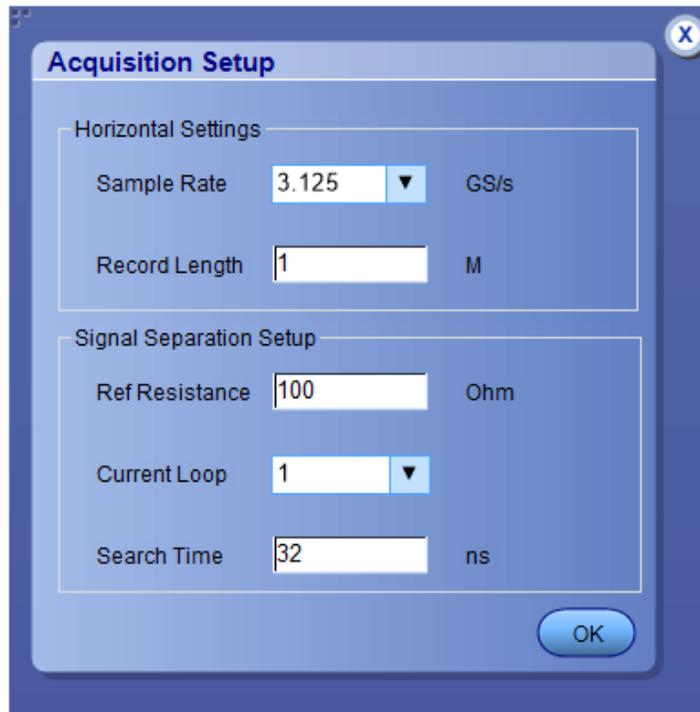


Figure 10: DUT tab - Acquisition Setup

Table 7: DUT tab - Acquisition Setup

Setting	Description
Horizontal Settings	
Sample Rate	<p>Selects the sample rate from the drop-down option.</p> <p>100BASE-T1</p> <ul style="list-style-type: none"> ■ 0.625 GS/s ■ 1.5625 GS/s ■ 3.125 GS/s ■ 6.25 GS/s ■ 12.5 GS/s ■ 25 GS/s ■ 50 GS/s <p>1000BASE-T1</p> <ul style="list-style-type: none"> ■ 1.5625 GS/s ■ 3.125 GS/s ■ 6.25 GS/s ■ 12.5 GS/s

Setting	Description
	<ul style="list-style-type: none"> ■ 25 GS/s ■ 50 GS/s
Record Length	Enter the record length. Range is from 0.1 M to 20 M.
Signal Separation Setup	
Ref Resistance	Enter the reference resistance. Range is from 1 Ohm to 200 Ohms.
Current Loop	<p>Selects the current loop value from the drop-down option.</p> <ul style="list-style-type: none"> ■ 1 ■ 2 ■ 3 ■ 4
Search Time	Enter the search time. Range is from 1 ns to 1000 ns.

The following parameters are applicable for signal corrections setup:

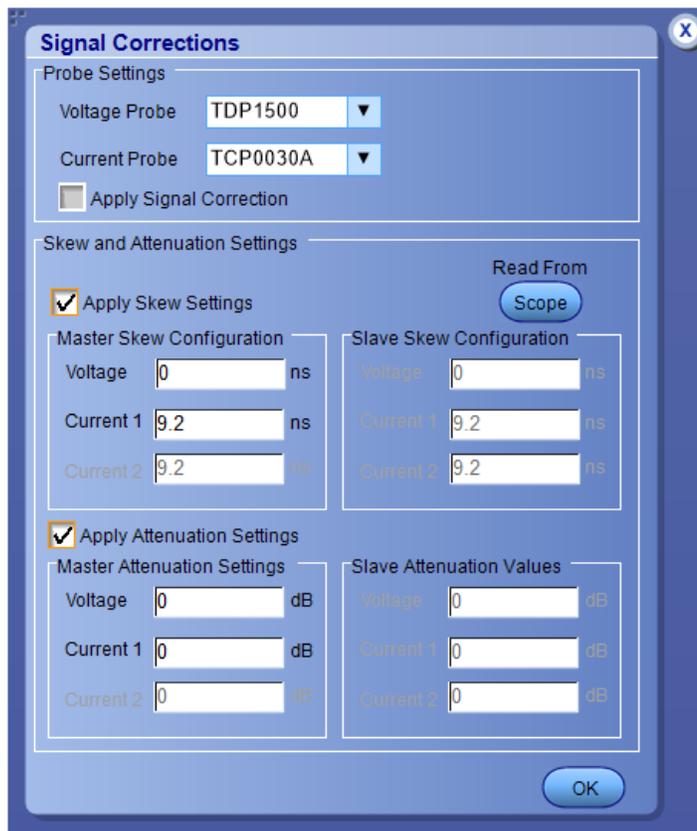


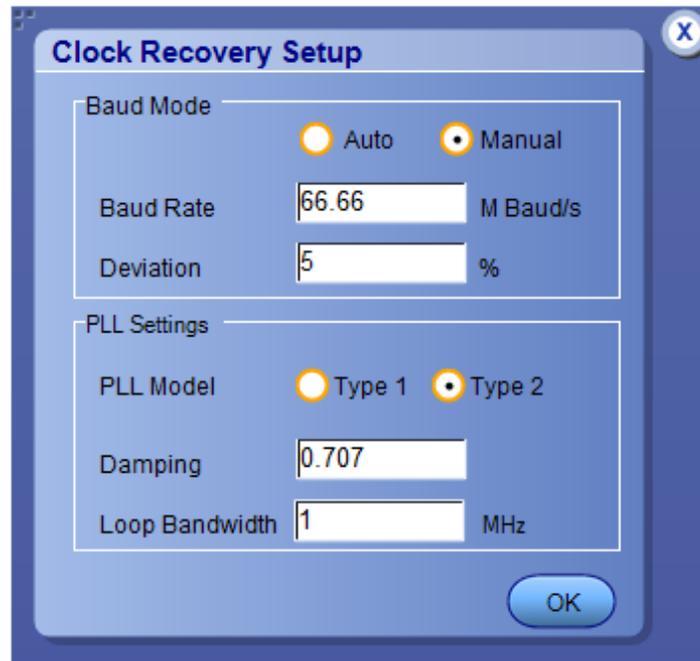
Figure 11: DUT tab - Signal corrections

Table 8: DUT tab - Signal corrections

Setting	Description
Probe Settings	
Voltage Probe	Select the preferred voltage probe from the drop-down option. 100BASE-T1 <ul style="list-style-type: none"> ■ TDP1500 ■ TDP3500 1000BASE-T1 <ul style="list-style-type: none"> ■ TDP3500

Setting	Description
Current Probe	Select the preferred current probe from the drop-down option. 100BASE-T1 <ul style="list-style-type: none"> ■ TCP0030A ■ P6022 ■ CT6 1000BASE-T1 <ul style="list-style-type: none"> ■ CT6
Ratio	Select the preferred ratio from the drop-down option. <ul style="list-style-type: none"> ■ 1 ■ 10 <hr/> <p>NOTE. This is enabled only when the P6022 is selected as the current probe.</p>
Apply Signal Correction	Select to apply the signal correction to the signal.
Skew and Attenuation Settings	
Apply Skew Settings	Select to apply the skew settings.
Master/Slave Skew Configuration	
Voltage	Enter the voltage value in the text field. The unit is ns.
Current1	Enter the current1 value in the text field. The unit is ns.
Current2	Enter the curren2 value in the text field. The unit is ns.
Apply Attenuation Settings	Select to apply the attenuation settings.
Master/Slave Attenuation Settings	
Voltage	Enter the voltage value in the text field. The unit is db.
Current1	Enter the current1 value in the text field. The unit is db.
Current2	Enter the curren2 value in the text field. The unit is db.

The following parameters are applicable for clock recovery setup:



The image shows a software dialog box titled "Clock Recovery Setup". It is divided into two sections: "Baud Mode" and "PLL Settings".

Baud Mode:

- Radio buttons for "Auto" and "Manual". "Manual" is selected.
- Baud Rate: 66.66 M Baud/s
- Deviation: 5 %

PLL Settings:

- Radio buttons for "Type 1" and "Type 2". "Type 2" is selected.
- Damping: 0.707
- Loop Bandwidth: 1 MHz

An "OK" button is located at the bottom right of the dialog box.

Figure 12: DUT tab - Clock Recovery

Table 9: DUT tab - Clock Recovery

Setting	Description
Baud Mode	<p>Selects the preferred baud mode</p> <ul style="list-style-type: none"> ■ Auto ■ Manual
Baud Rate	<p>Enter the baud rate value in the text field. The unit is M Bauds/s.</p> <hr/> <p>NOTE. This is editable only when the manual mode is selected.</p> <hr/>
Deviation	<p>Enter the deviation value in the text field. The unit is %.</p> <hr/> <p>NOTE. This is editable only when the manual mode is selected.</p> <hr/>
PLL Settings	
PLL Model	<p>Phase Locked Loop (PLL) simulates the behavior of the specified hardware. PLL clock recovery circuit is used to derive the clock signal. There are two types of PLL.</p> <ul style="list-style-type: none"> ■ Type 1 ■ Type 2 <hr/> <p>NOTE. This is editable only when the manual mode is selected.</p> <hr/>
Damping	<p>Enter the damping value in the text field.</p> <hr/> <p>NOTE. This is editable only when the manual mode is selected.</p> <hr/>
Loop Bandwidth	<p>Enter the loop bandwidth value in the text field. The unit is MHz.</p> <hr/> <p>NOTE. This is editable only when the manual mode is selected.</p> <hr/>

The following parameters are applicable for De-Embed filter setup:

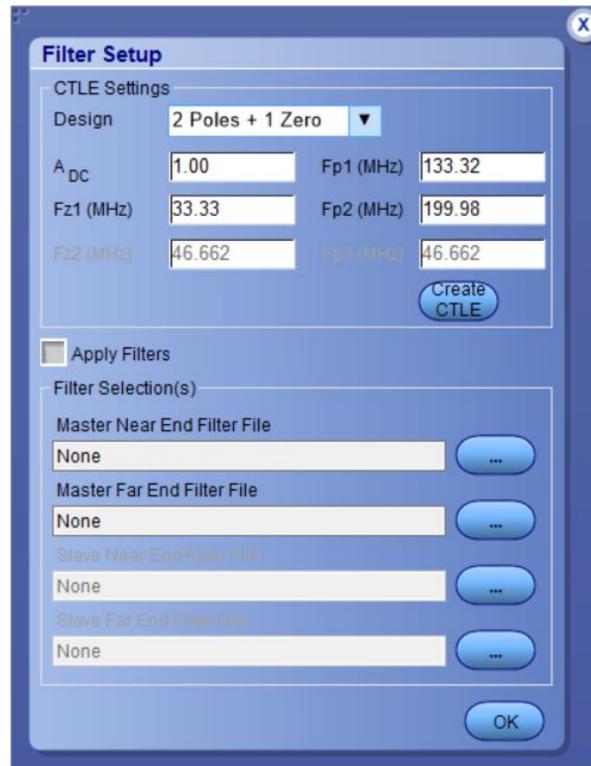


Figure 13: DUT tab - De-Embed Filter for 100BASE-T1

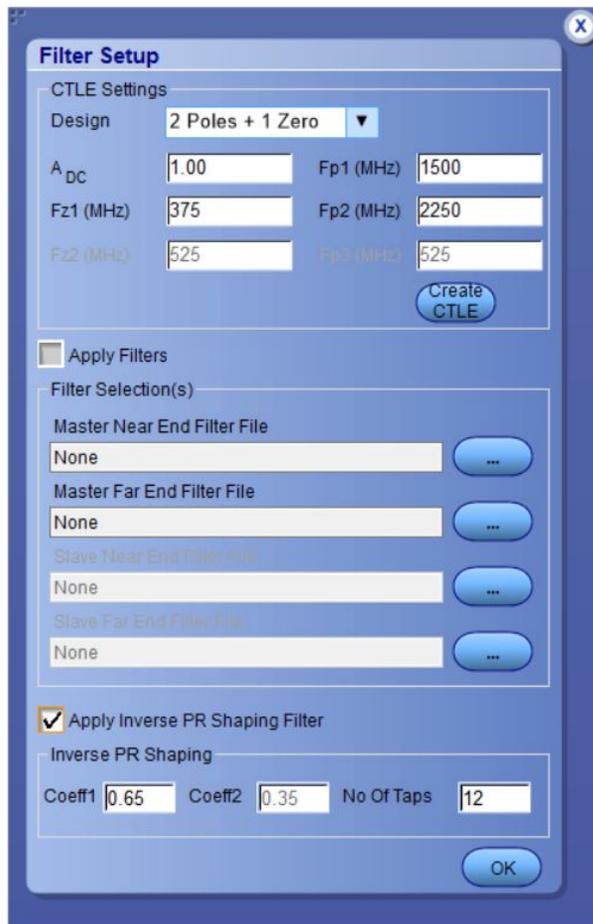


Figure 14: DUT tab - De-Embed Filter for 1000BASE-T1

Table 10: DUT tab - De-Embed Filter

Setting	Description
CTLE Settings	
Design	<p>Continuous Time Linear Equalizer (CTLE) boosts high frequency component of signal. CTLE is implemented using two design methods. Select the design from the drop-down option.</p> <ul style="list-style-type: none"> ■ 2 Poles + 1 Zero ■ 3 Poles + 2 Zeros
Create CTLE	Click to generate CTLE filter files as per the selected design and load the generated filter files automatically on the respective browse buttons.
A_{DC}	Enter the DC gain value in the text filed.
F_{Z1} (MHz)	Enter the first zero frequency value in the text filed.
F_{Z2} (MHz)	<p>Enter the second zero frequency value in the text filed.</p> <p>NOTE. This is enabled when design is selected with 3 poles and 2 zeros.</p>
F_{p1} (MHz)	Enter the first pole frequency value in the text filed.
F_{p2} (MHz)	Enter the second pole frequency value in the text filed.
F_{p3} (MHz)	<p>Enter the third pole frequency value in the text filed.</p> <p>NOTE. This is enabled when design is selected with 3 poles and 2 zeros.</p>
Apply Filters	Select to apply filters to the signal.
Filter Selections(s)	
Master/Slave Near End Filter File	Browse and select the preferred Master/Slave near end filter file.
Master/Slave Far End Filter File	Browse and select the preferred Master/Slave far end filter file.
Apply Inverse PR Shaping Filter	<p>Partial Response (PR) shaping is a filtering method. This is achieved by introducing a known ISI (Inter symbol interference) and it is applied to PAM-X symbol bursts to lower the Power Spectral Density (PSD).</p> <p>Select to apply the inverse PR Shaping filter to the signal.</p> <p>NOTE. This is applicable only when the suite selected is 1000BASE-T1.</p>
Inverse PR Shaping	
Coeff1	<p>Enter the first coefficient of the PR Shaping filter in the text field.</p> <p>NOTE. This is applicable only when the suite selected is 1000BASE-T1.</p>
Coeff2	<p>The Coeff2 value is automatically taken based on the given Coeff1 value. Coeff2 = Coeff1-1</p> <p>NOTE. This is applicable only when the suite selected is 1000BASE-T1.</p>

Setting	Description
No Of Taps	Enter the number of taps for the Inverse PR Shaping filter in the text filed.
	NOTE. This is applicable only when the suite selected is 1000BASE-T1.

See also. [Select tests](#)

Select tests Use the **Test Selection** tab to select the tests.

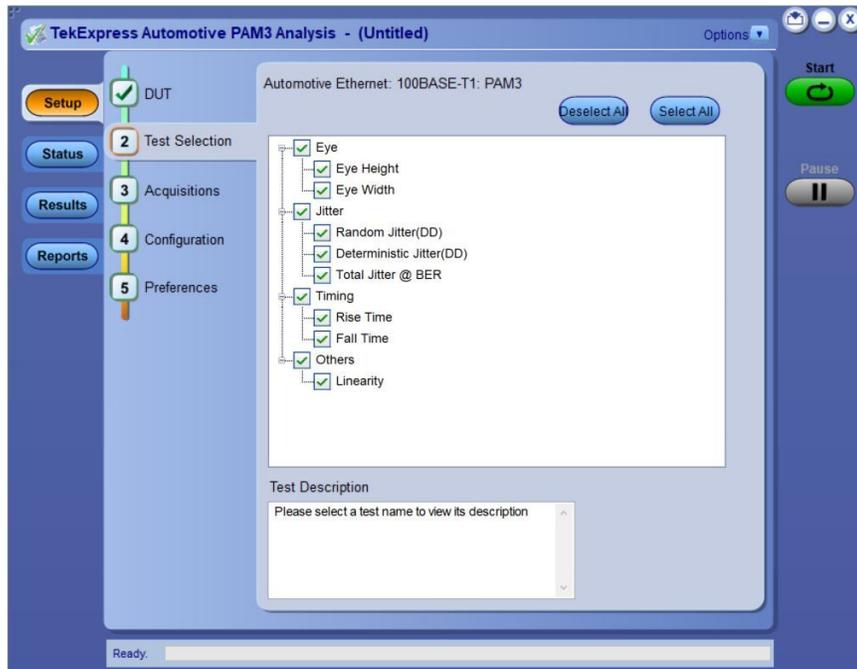


Figure 15: TekExpress Automotive PAM3 measurements

Table 11: Test Selection tab settings

Setting	Description
Deselect All Select All	Deselect or select all tests in the list.
Tests	Click on a test to select or unselect. Highlight a test to show details in the Test Description pane.
Test Description	Shows brief description of the highlighted test in the test tree.

See also. [Set acquisition tab parameters](#)

Set acquisition tab parameters

Use the **Acquisitions** tab to view the tests.

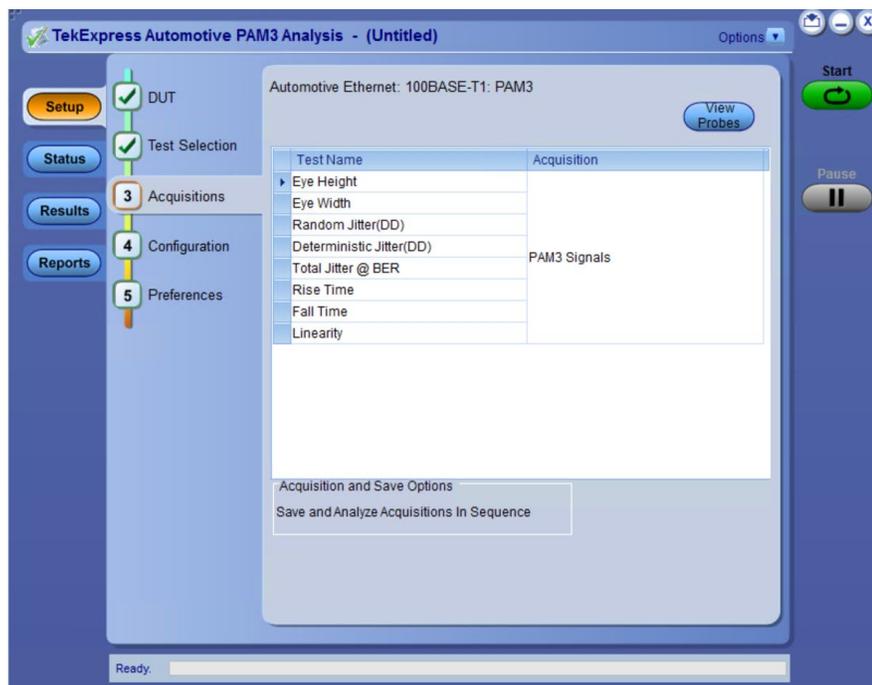


Figure 16: Acquisitions tab

Table 12: Acquisitions tab settings

Settings	Description
View Probes	Displays the detected probe configuration. Use the View Probes dialog box to view the connected probes.

The TekExpress Automotive PAM3 Analysis application saves all acquisition waveforms to files by default. Waveforms are saved in a unique folder for each session (a session is started when you click the **Start** button). The folder path is X:\TekExpress Automotive PAM3 Analysis\Untitled Session\

Saving a session moves the session file contents from the Untitled Session folder to the specified folder name, and changes the session name to the specified name.

Signal Separation files are stored at X:\Automotive PAM3 Analysis \SignalSeparationWaveforms .

Set configuration tab parameters

Use the **Configuration** tab to view and configure the Global Settings and the measurement configurations. The measurement specific configurations available in this tab depend on the selections made in the **Test Selection** panel.

Table 13: Configuration tab: Common parameters

Setting	Description
Limits Editor	Displays the upper and lower limits for the applicable measurement using different types of comparisons. When running tests in User Defined Mode, you can edit the limit settings in the Limits Editor.

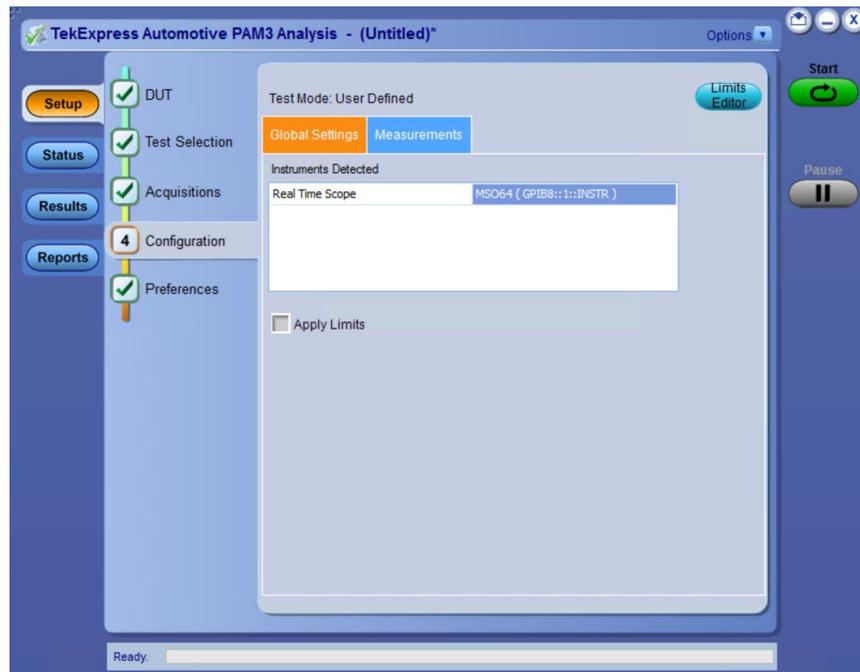
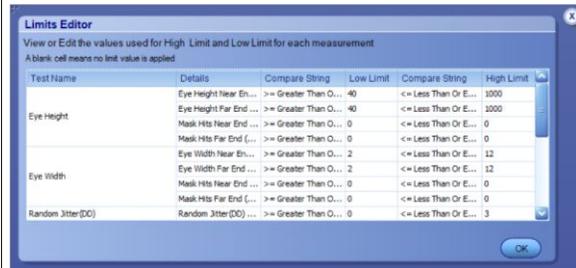


Figure 17: Configuration tab: Global Settings

Table 14: Configuration tab: Global settings

Setting	Description
Global Settings	
Instruments Detected	<p>Displays the instruments connected to this application. Click on the instrument name to open a list of available (detected) instruments.</p> <p>Select Options > Instrument Control Settings and click Refresh to update the instrument list.</p> <p>NOTE. Verify that the LAN and GPIB search criteria (default setting) in the Instrument Control Settings is selected when using the TekExpress Automotive PAM3 Analysis application.</p>
Apply Limits	Select to add limits for the measurements on report.

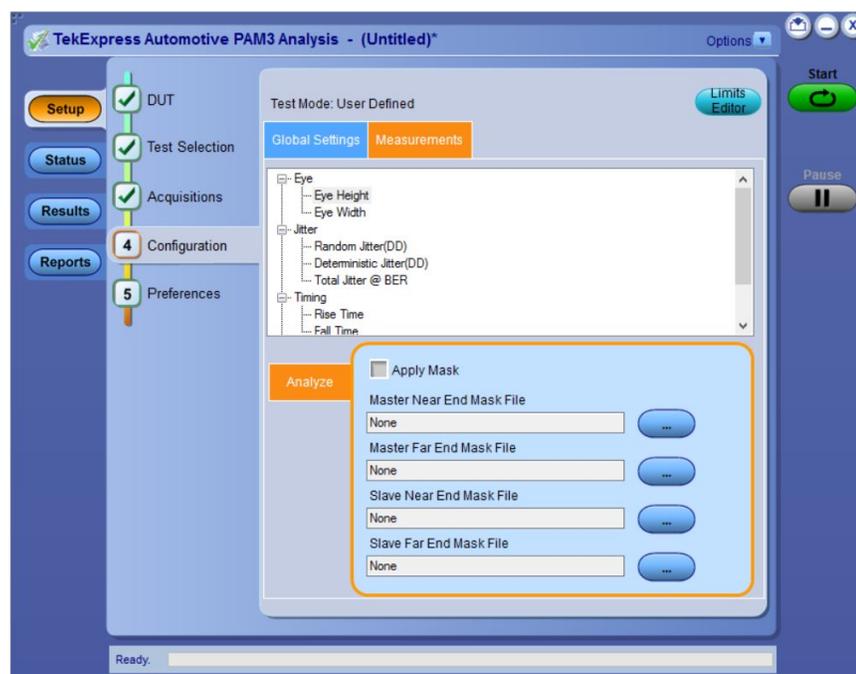


Figure 18: Configuration tab: Measurements

Table 15: Configuration tab: Measurements settings

Setting	Description
Measurements	<p>Displays the measurements that are selected in the Test Selection tab. The tests are grouped with unique acquisition type names.</p> <hr/> <p>NOTE.</p> <ul style="list-style-type: none"> ■ <i>When a parent test group is selected and any change is made, the change will be applied to all the tests.</i> ■ <i>Individual test configuration is possible by selecting the test and making the required changes.</i>
Analyze	
Apply Mask	Enable the check box to apply the selected mask file.
Master/Slave Near End Mask File	Browse and select the master or slave near end mask file.
Master/Slave Far End Mask File	Browse and select the master or slave far end mask file.
Pattern Detection	<p>Select the pattern from the drop-down option.</p> <ul style="list-style-type: none"> ■ Auto ■ Manual
Target BER	Enter the target BER value in the text field.
Levels	<p>Select the level from the drop-down option.</p> <ul style="list-style-type: none"> ■ 10%-90% ■ 20%-80%

Table 16: Configuration tab: Measurement specific configuration

Measurements	Configuration	Value
Eye <ul style="list-style-type: none"> ■ Eye Height ■ Eye Width 	Analyze	<ul style="list-style-type: none"> ■ Apply Mask ■ Master Near End Mask File ■ Slave Near End Mask File ■ Master Far End Mask File ■ Slave Far End Mask File
Jitter <ul style="list-style-type: none"> ■ Random Jitter(DD) ■ Deterministic Jitter(DD) 		Pattern Detection <ul style="list-style-type: none"> ■ Auto ■ Manual
		Pattern Detection - Manual- Pattern Type <ul style="list-style-type: none"> ■ Repeating - Pattern Length (UI) ranging from 2 to 100000 ■ Arbitrary - Window Length (UI) range from 2 to 24
Jitter: Total Jitter @ BER		Pattern Detection <ul style="list-style-type: none"> ■ Auto ■ Manual
	Pattern Detection - Manual- Pattern Type <ul style="list-style-type: none"> ■ Repeating - Pattern Length (UI) ranging from 2 to 100000 ■ Arbitrary - Window Length (UI) range from 2 to 24 	
		Target BER. Range is from 2 - 9.
Timing <ul style="list-style-type: none"> ■ Rise Time ■ Fall Time 		Levels <ul style="list-style-type: none"> ■ 20% - 80% ■ 10% - 80%

Set preferences tab parameters

Use **Preferences** tab to set the application action on completion of a measurement.

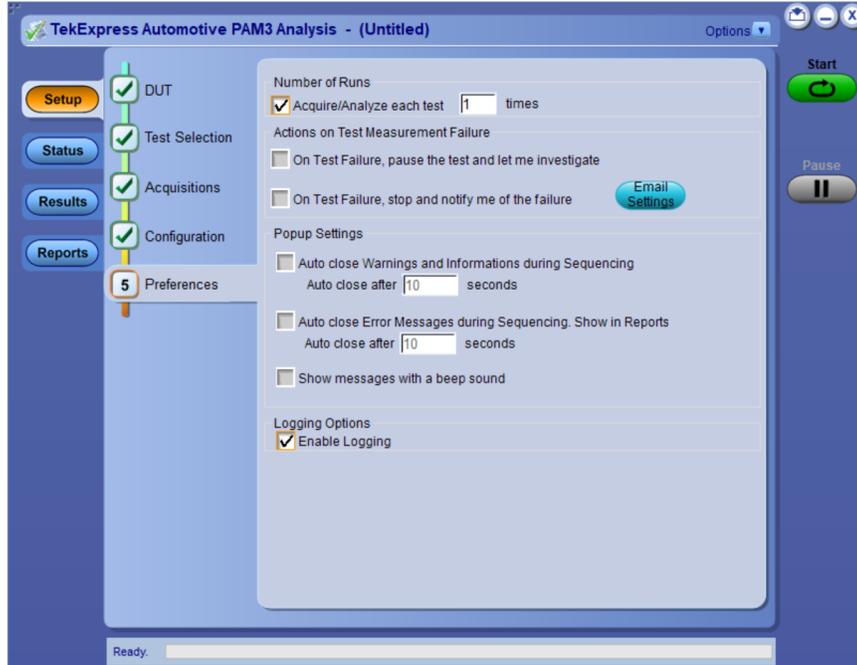


Figure 19: Preferences tab

Table 17: Preferences tab settings

Setting	Description
Number of Runs	
Acquire/Analyze each test <n> times	Select to repeat the test run by setting the number of times. The default value is 1.
Actions on Test Measurement Failure	
On Test Failure, pause the test and let me investigate	Select to pause the test run on Test Failure, for further investigations. By default, it is unselected.
On Test Failure, stop and notify me of the failure	Select to stop the test run on Test Failure, and to get notified via email. By default, it is unselected. Click Email Settings to configure.
	NOTE. Ensure that the email settings are configured correctly. If the settings are not done correctly, the test will be stopped and no other notifications will be sent.
Popup Settings	
Auto close Warnings and Informations during Sequencing Auto close after <n> Seconds	Select to auto close warnings/informations during sequencing. Set the Auto close time. By default it is unselected. Range is from 1-60.

Setting	Description
Auto close Error Messages during Sequencing. Show in Reports Auto close after <n> Seconds	Select to auto close Error Messages during Sequencing. Set the Auto close time. By default it is unselected. Range is from 1-60.
Logging options	
Enable Logging	Select to enable logging.

Status panel overview

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

Test Status: It displays the tests along with the Acquisition type, Acquire, and Analysis status of the tests. In pre-recorded mode, Acquire status is not valid.

Log View: It displays the detailed execution status of the tests.

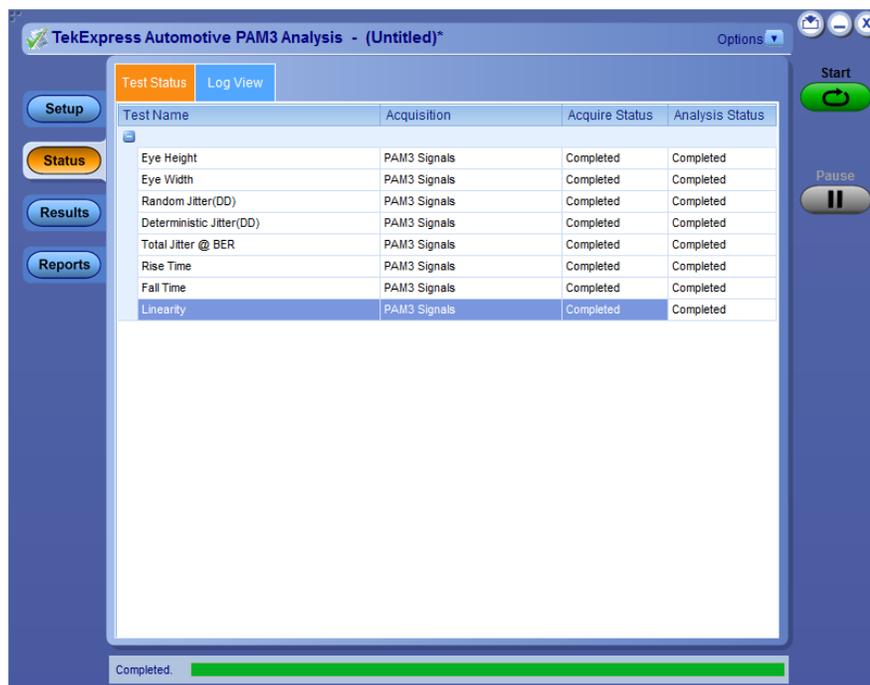


Figure 20: Test status view in the Status panel

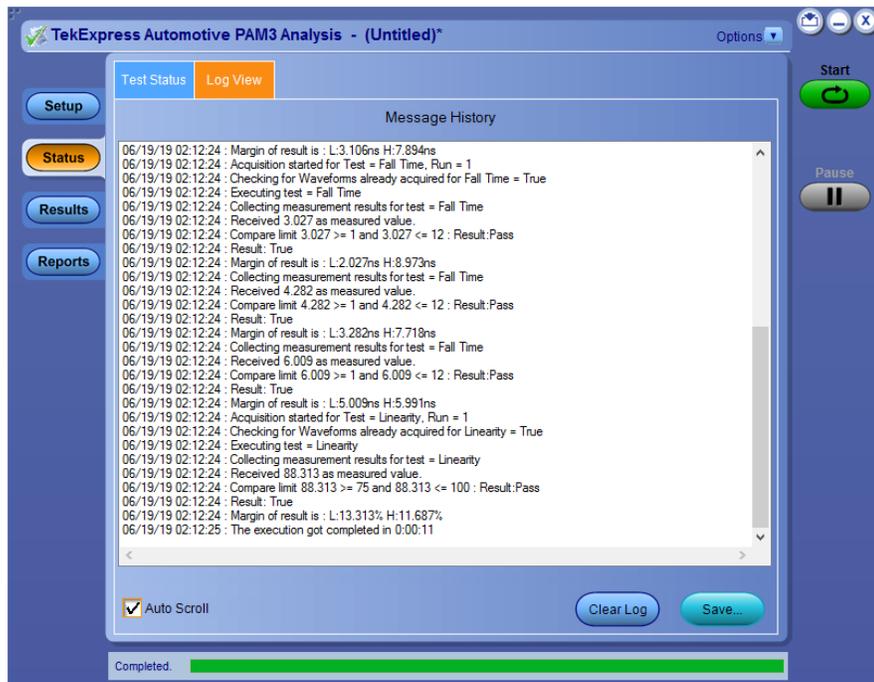


Figure 21: Log view in the Status panel

Table 18: Status panel settings

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

See also [Application panel overview](#)

Results panel

Results panel overview

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

Test Name	Pass/Fail	Iteration	Test Point	Signal Type	Eye Section	Value	Mark
Eye Height	Informative	1	Master	Near End	Upper Eye	0.0000	N.A
Eye Height	Informative	1	Master	Near End	Lower Eye	0.0000	N.A
Eye Height	Informative	1	Master	Far End	Upper Eye	189.476	N.A
Eye Height	Informative	1	Master	Far End	Lower Eye	0.0000	N.A
Eye Width	Informative	1	Master	Near End	Upper Eye	0.0000	N.A
Eye Width	Informative	1	Master	Near End	Lower Eye	0.0000	N.A
Eye Width	Informative	1	Master	Far End	Upper Eye	6.5630	N.A
Eye Width	Informative	1	Master	Far End	Lower Eye	0.0000	N.A
Random Jitter(DD)	Informative	1	Master	Near End	Upper Eye	777.881	N.A
Random Jitter(DD)	Informative	1	Master	Near End	Lower Eye	1665.2047	N.A
Random Jitter(DD)	Informative	1	Master	Far End	Upper Eye	0.9979	N.A
Random Jitter(DD)	Informative	1	Master	Far End	Lower Eye	1.0311	N.A
Deterministic Jitter(DD)	Informative	1	Master	Near End	Upper Eye	4838.0695	N.A
Deterministic Jitter(DD)	Informative	1	Master	Near End	Lower Eye	13825.9229	N.A
Deterministic Jitter(DD)	Informative	1	Master	Far End	Upper Eye	2.1405	N.A
Deterministic Jitter(DD)	Informative	1	Master	Far End	Lower Eye	1.8931	N.A
Total Jitter @ BER	Informative	1	Master	Near End	Upper Eye	11060.2615	N.A
Total Jitter @ BER	Informative	1	Master	Near End	Lower Eye	26441.2777	N.A

Figure 22: Results panel

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

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

to a double-ended arrow, hold down the mouse button and drag the column to the desired width.

- To clear all test results displayed, click **Clear**.

See also. [View a report](#)

[Application panel overview](#)

Preferences menu

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

- To include pass/fail details info in the details table, select **Show Pass/Fail**.
- To view the results summary, select **View Results Summary**.
- To expand all tests listed, select **View Results Details**
- To enable or disable the wordwrap feature, select **Enable Wordwrap**.

See also. [Results panel overview](#)

View test-related files

Files related to tests are stored in X:\My TekExpress\Automotive PAM3 Analysis \Untitled session folder. Each test setup in this folder has both a test setup *file* and a test setup folder, both with the test setup name.

The test setup file is preceded by the TekExpress icon and usually has no visible file name extension.

Inside the test setup folder is another folder named for the DUT ID used in the test sessions. The default is DUT001.

Inside the DUT001 folder are the session folders and files. Each session also has a folder and file pair, both named for the test session using the naming convention (date)_(time). Each session file is stored outside its matching session folder:

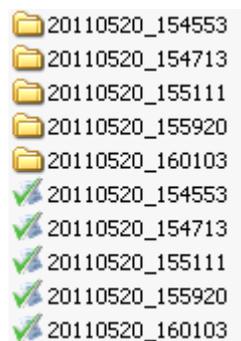


Figure 23: Test-related files

Each session folder contains image files of any plots generated from running the test session. If you selected to save all waveforms or ran tests using prerecorded waveform files, these are included here.

The first time you run a new, unsaved session, the session files are stored in the Untitled Session folder located at X:\Automotive PAM3 Analysis. When you name and save the session, the files are placed in a folder with the name that you specify. A copy of the test files stay in the Untitled Session folder until you run a new test or until you close the TekExpress Automotive PAM3 Analysis application.

See also. [File name extensions](#)

Reports panel

Reports panel overview

Use the **Reports** panel to configure report generation settings parameters, view the report, generate the report, browse for reports, name and save reports, select test content to include in reports, and select report viewing options.

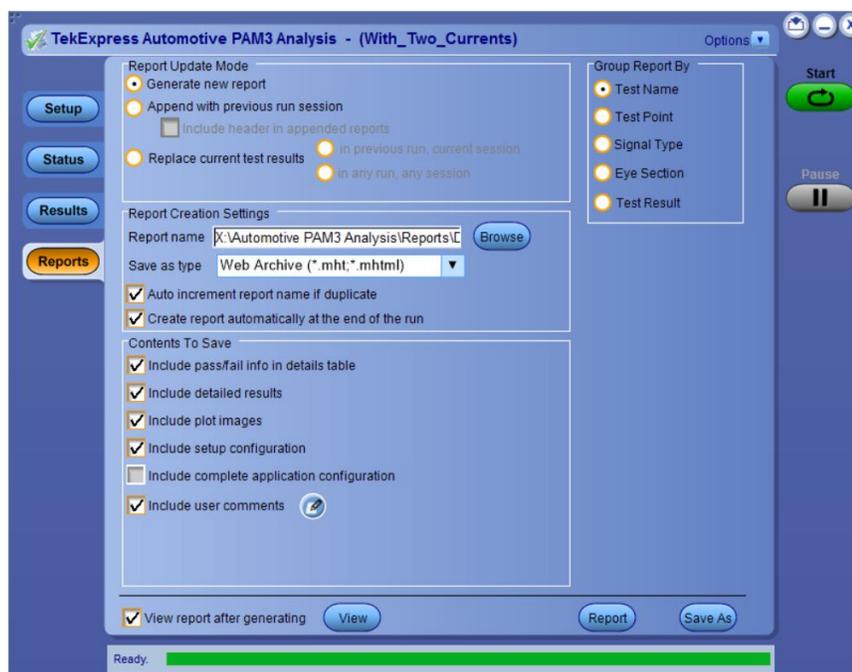


Figure 24: Reports panel

For information on setting up reports, see [Select report options](#). For information on viewing reports, see [View a report](#).

See also. [View a report](#)

[Application panels overview](#)

Select report options

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

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

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

Table 19: Report options

Setting	Description
Report Update Mode	
Generate new report	Creates a new report. The report can be in either .mht or .pdf file formats.
Append with previous run session	Appends the latest test results to the end of the current test results report.
Include header in appended reports	Select to include header in appended reports
Replace current test results	Replaces the previous test results with the latest test results. Results from newly added tests are appended to the end of the report.
In previous run, current session	Select to replace current test results in the report with the test result(s) of previous run in the current session.
In any run, any session	Select to replace current test results in the report with the test result(s) in the selected run session's report.
Report Creation Settings	
Report name	<p>Displays the name and location at which to store PAM3 report. The default location is at \My TekExpress\PAM3 Analysis\Untitled Session. The report file in this folder gets overwritten each time you run a test unless you specify a unique name or select to auto increment the report name.</p> <p>Change the report name or location.</p> <p>Do one of the following:</p> <ul style="list-style-type: none"> ■ In the Report Path field, type over the current folder path and name. ■ Double-click in the Report Path field and then make selections from the popup keyboard and click the Enter button. <p>Be sure to include the entire folder path, the file name, and the file extension. For example: C:\Documents and Settings\your user name\My Documents\My TekExpress\Automotive PAM3 Analysis\DUT001.mht.</p> <p>NOTE. You cannot set the file location using the Browse button.</p> <p>Open an existing report.</p> <p>Click Browse, locate and select the report file and then click View at the bottom of the panel.</p>

Setting	Description
Save as type	Saves a report in the specified file type, selected from the drop-down list. The report are saved in .csv, .pdf or .mht. NOTE. If you select a file type different from the default, be sure to change the report file name extension in the Report Name field to match.
Auto increment report name if duplicate	Sets the application to automatically increment the name of the report file if the application finds a file with the same name as the one being generated. For example: DUT001, DUT002, DUT003. This option is enabled by default.
Create report automatically at the end of the run	Creates report at the end of the run.
Contents To Save	
Include pass/fail info in details table	Includes pass/fail info in the details table of the report.
Include detailed results	Includes detailed results in the report.
Include plot images	Includes the plot images in the report.
Include setup configuration	Sets the application to include hardware and software information in the summary box at the top of the report. Information includes the oscilloscope model and serial number, the oscilloscope firmware version, and software versions for applications used in the measurements.
Include complete application configuration	Select to complete application configuration.
Include user comments	Select to include any comments about the test that you or another user added in the DUT tab of the Setup panel. Comments appear in the Comments section, under the summary box at the beginning of each report.
Group Report By	
Test Name	Select to group the tests in the report by test name.
Test Point	Select to group the tests in the report by the test point.
Signal Type	Select to group the tests in the report by the signal type.
Eye Selection	Select to group the tests in the report by sections of the eye-diagram.
Test Result	Select to group the tests in the report by test results
View report after generating	Automatically opens the report in a Web browser when the test completes. This option is selected by default.
View	Click to view the most current report.
Report	Generates a new report based on the current analysis results.
Save As	Specify a name for the report.

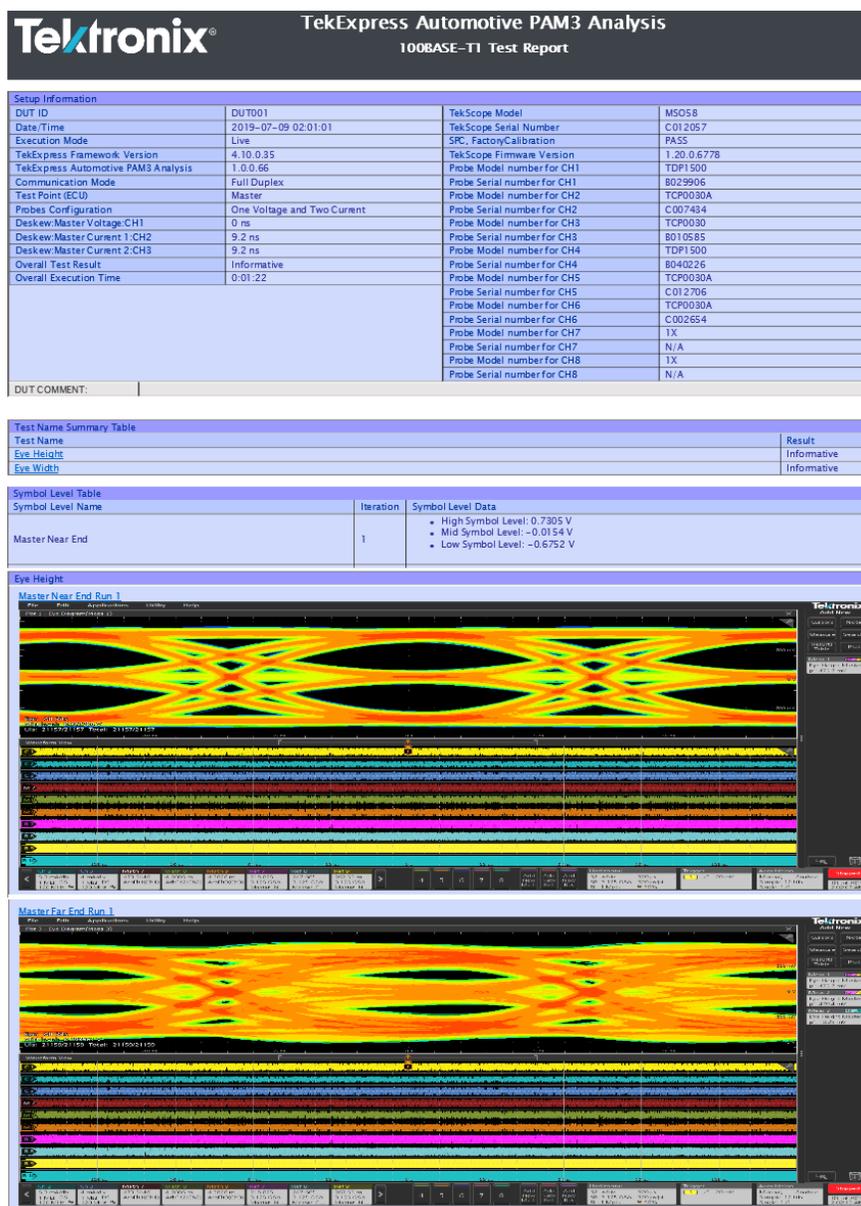
View a report The application automatically generates a report when test execution is complete and displays the report in your default Web browser (unless you cleared the **View Report After Generating** check box in the Reports panel before running the test). If you cleared this check box, or to view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

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

NOTE. *The Iteration column will be displayed only when more than one test run is selected.*

For information on changing the file type, file name, and other report options, see [Select report options](#).

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



Setup configuration information

The summary box at the beginning of the report lists setup configuration information. This information includes the oscilloscope model and serial number, optical module model and serial number, and software version numbers of all associated applications.

To exclude this information from a report, clear the **Include Setup Configuration** check box in the Reports panel before running the test.

User comments

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

See also. [Results panel overview](#)

[View test-related files](#)

Running tests

Equipment connection diagram

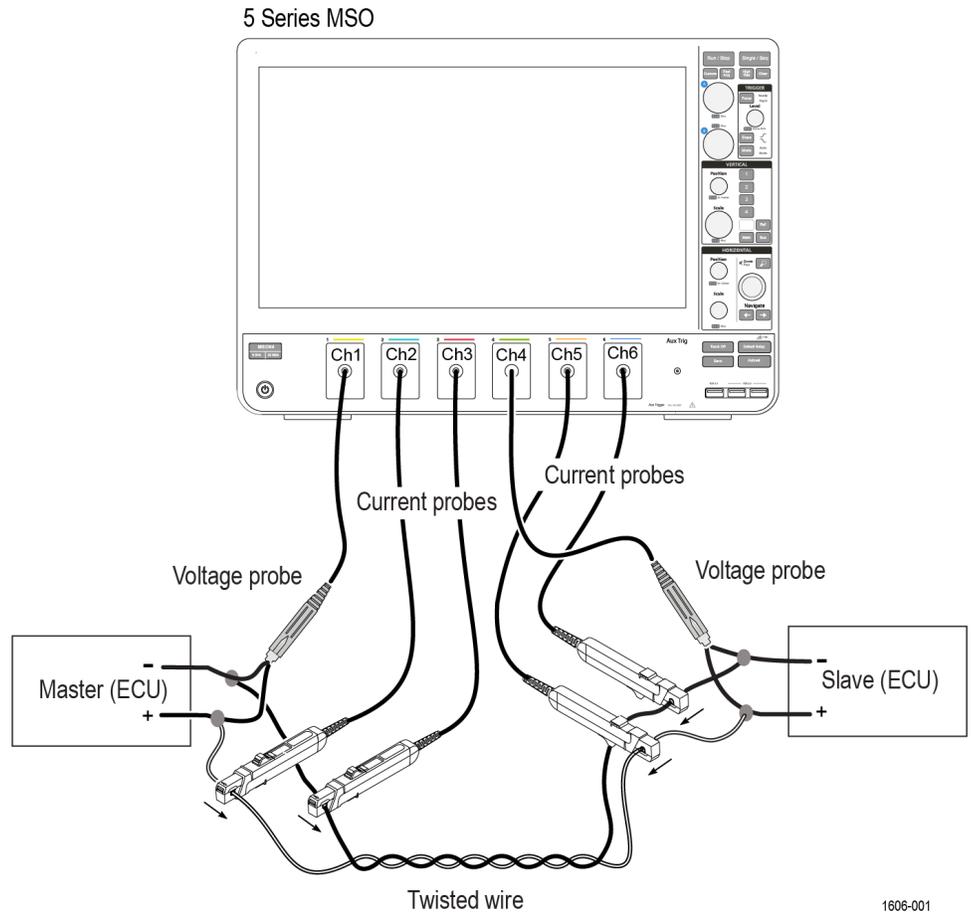


Figure 25: Test setup for 100BASE-T1 Full Duplex mode using both Master and Slave for One Voltage and Two Current

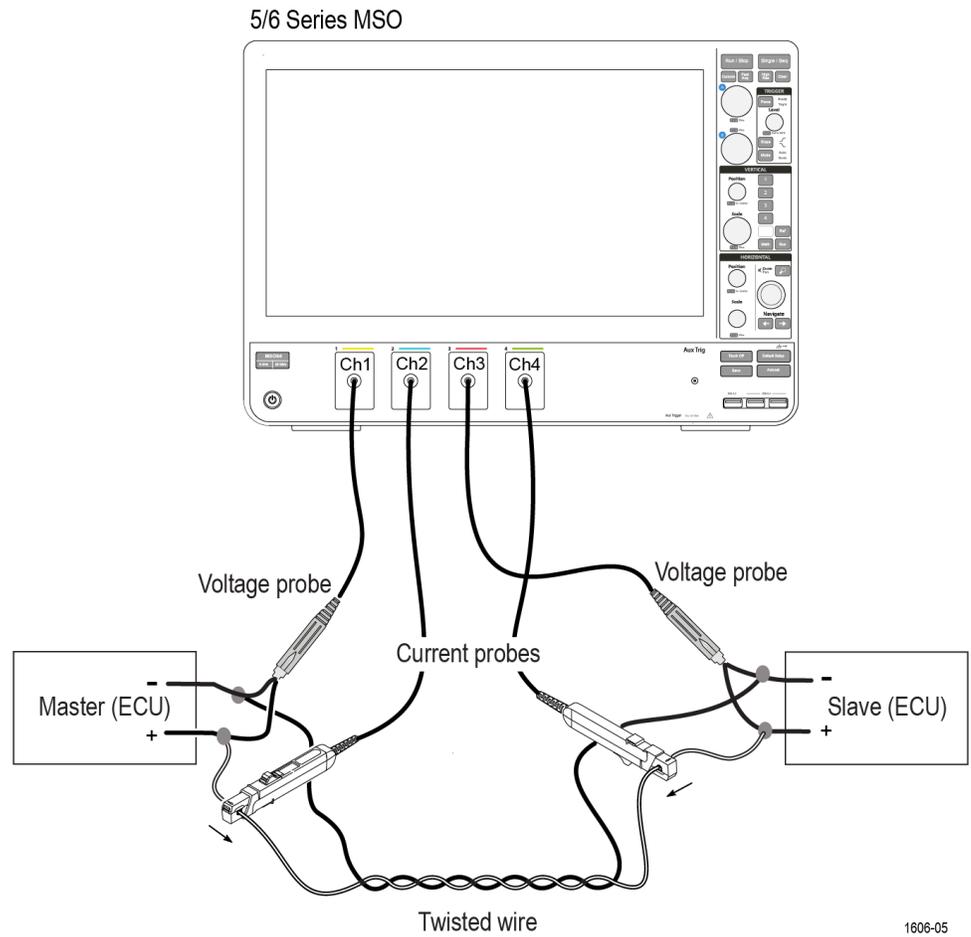


Figure 26: Test setup for 100BASE-T1 Full Duplex mode using both Master and Slave for One Voltage and One Current

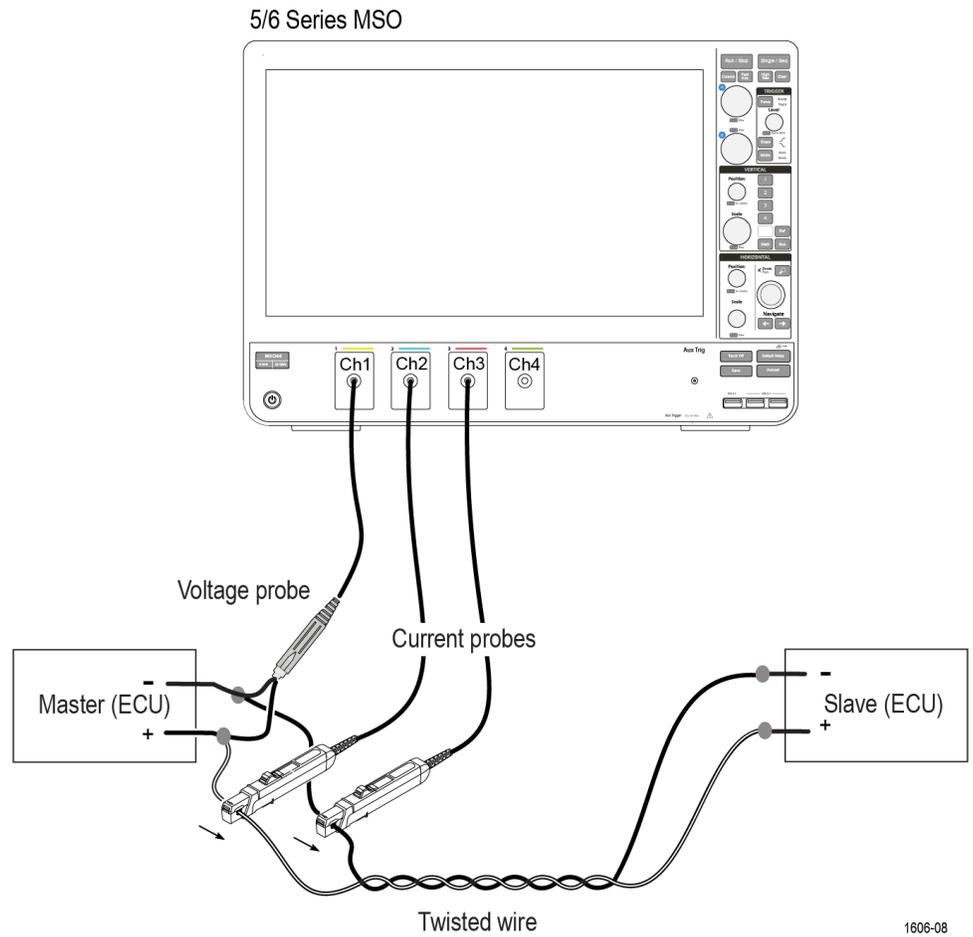


Figure 27: Test setup for 100BASE-T1 Full Duplex mode using Master for One Voltage and Two Current

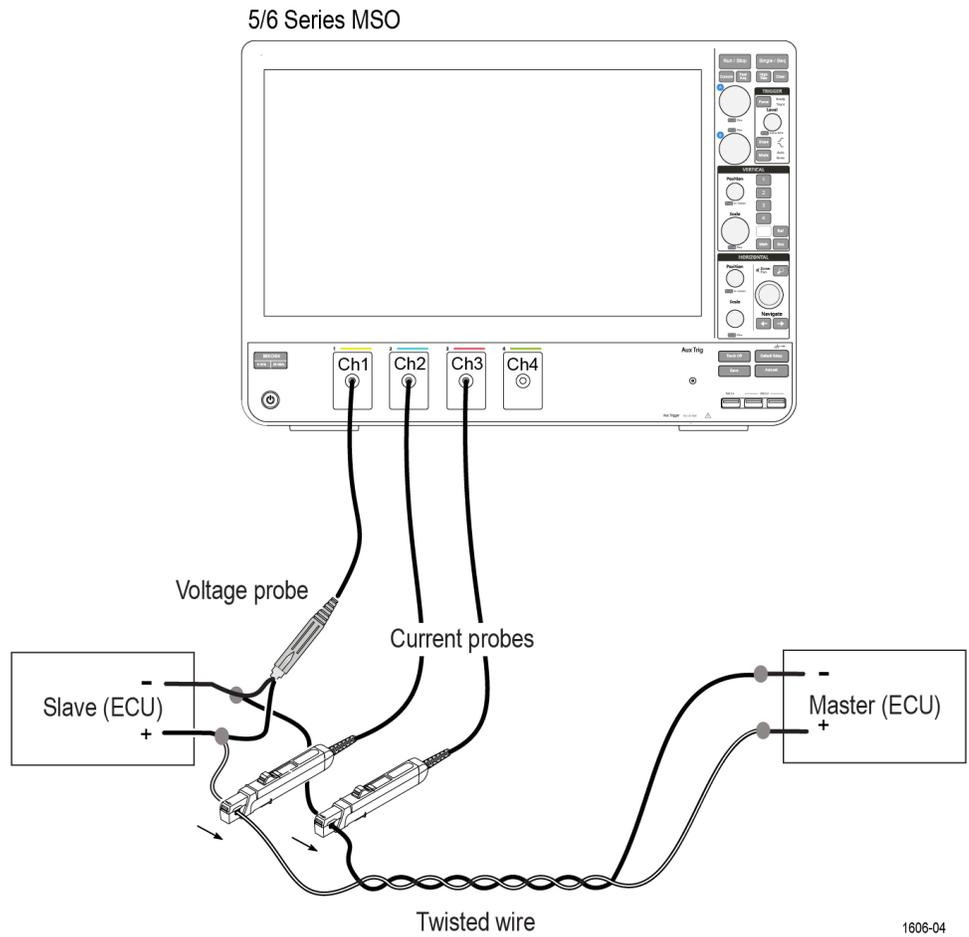


Figure 28: Test setup for 100BASE-T1 Full Duplex mode using Slave for One Voltage and Two Current

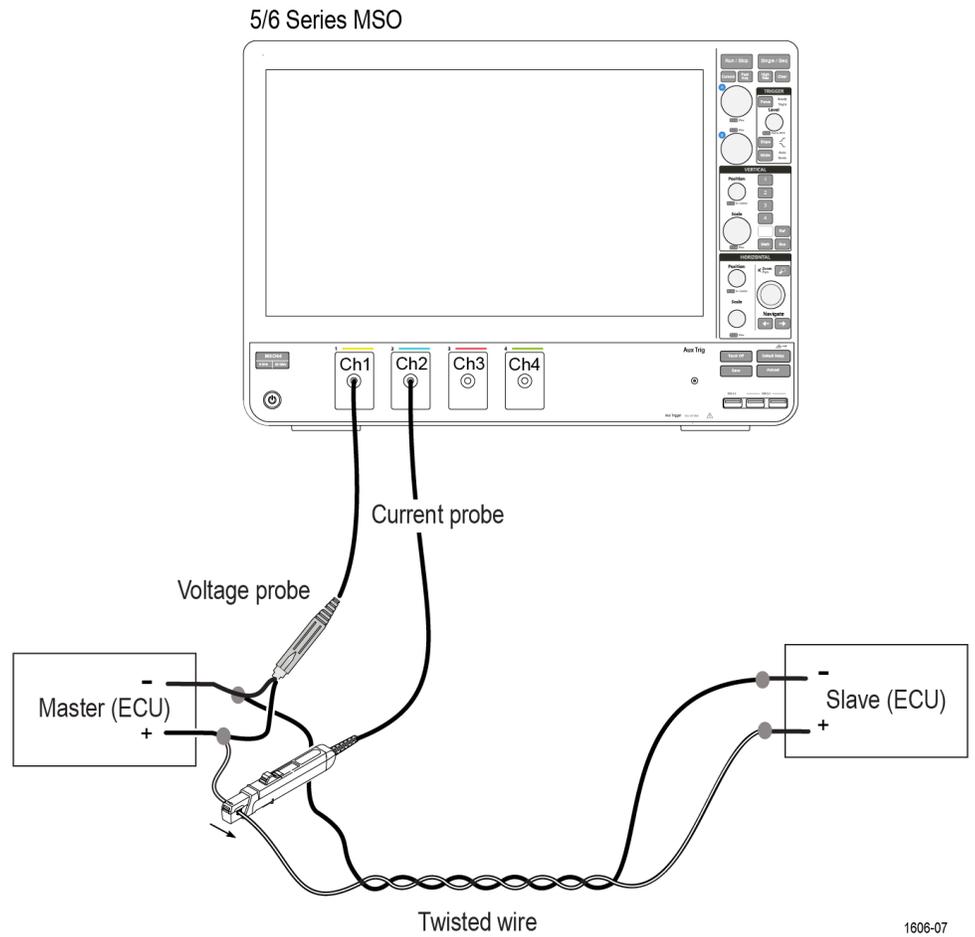


Figure 29: Test setup for 100BASE-T1 Full Duplex mode using Master for One Voltage and One Current

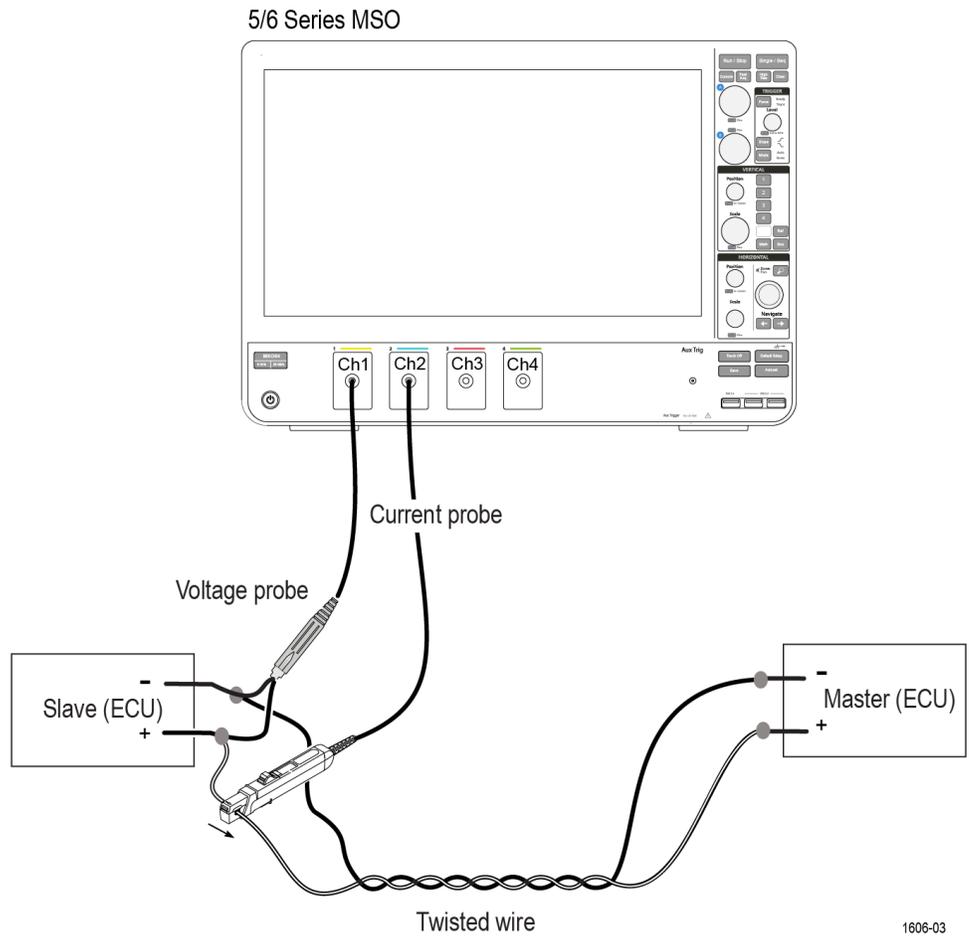


Figure 30: Test setup for 100BASE-T1 Full Duplex mode using Slave for One Voltage and One Current

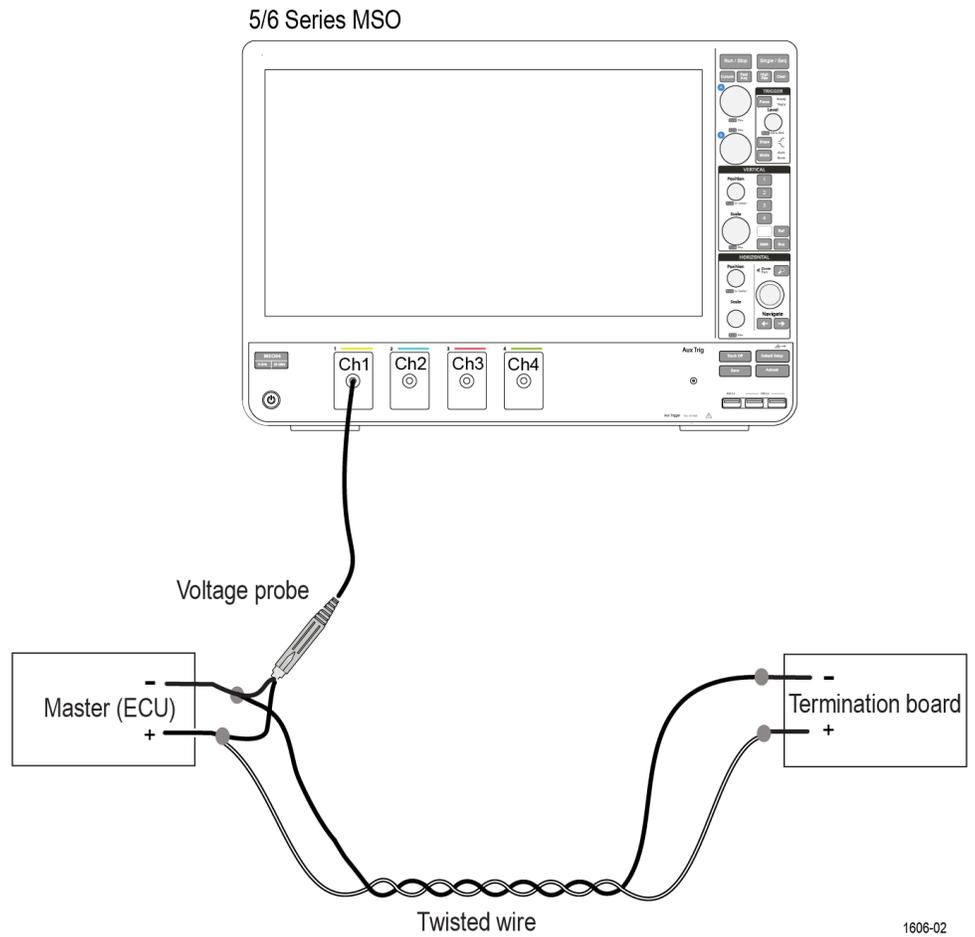


Figure 31: Test setup for 100BASE-T1 Half Duplex mode using Master for One Voltage

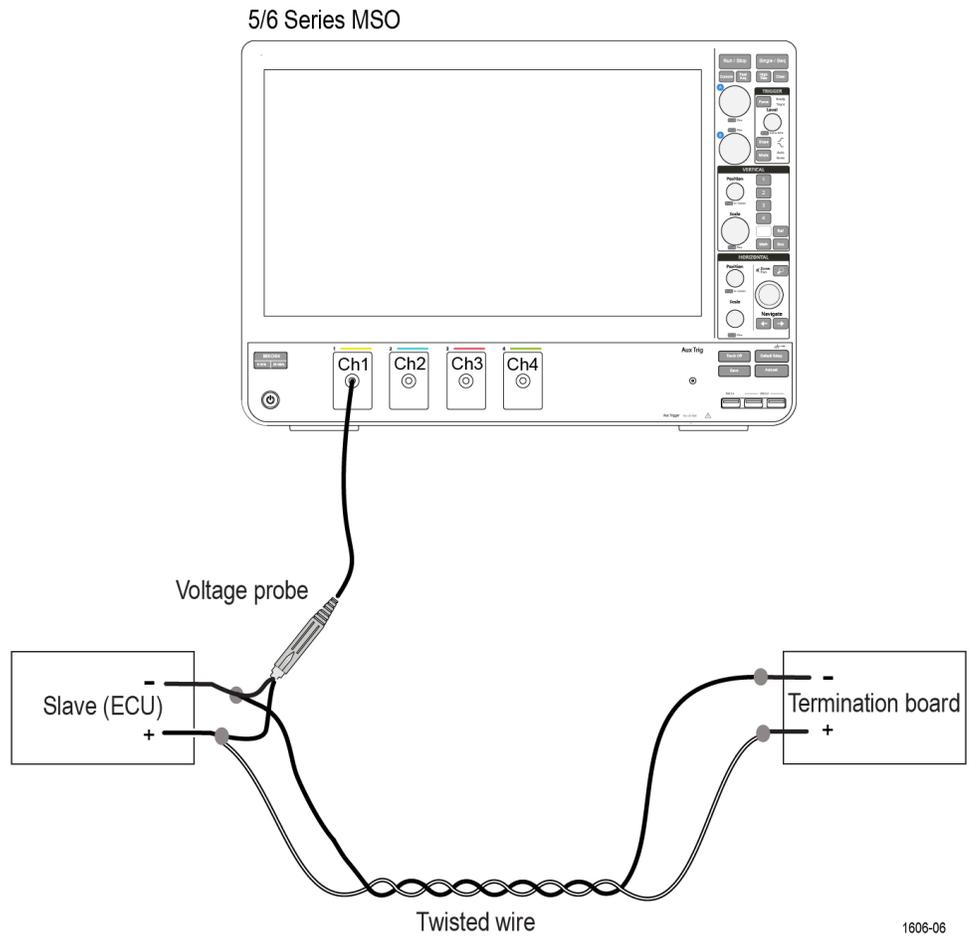


Figure 32: Test setup for 100BASE-T1 Half Duplex mode using Slave for One Voltage

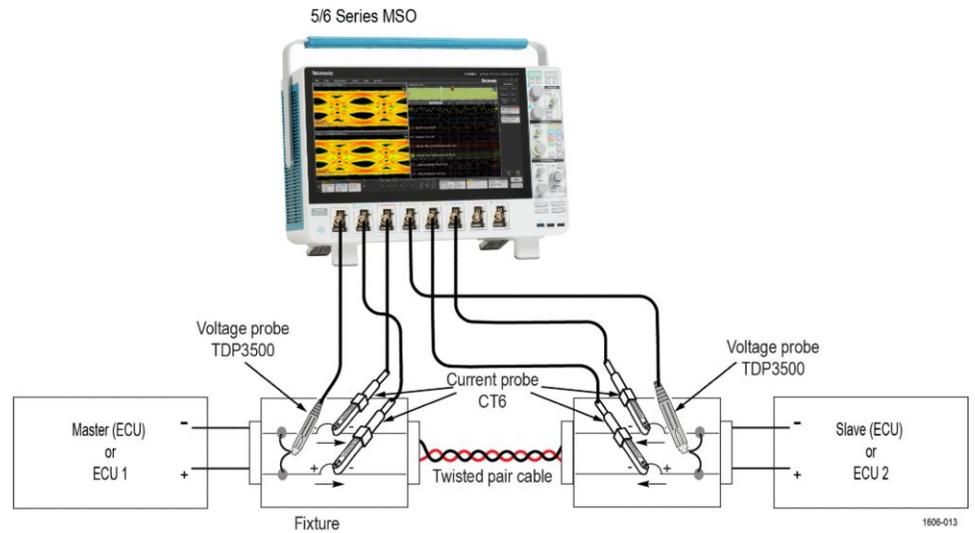


Figure 33: Test setup for 1000BASE-T1 Full Duplex mode using both Master and Slave for One Voltage and Two Current

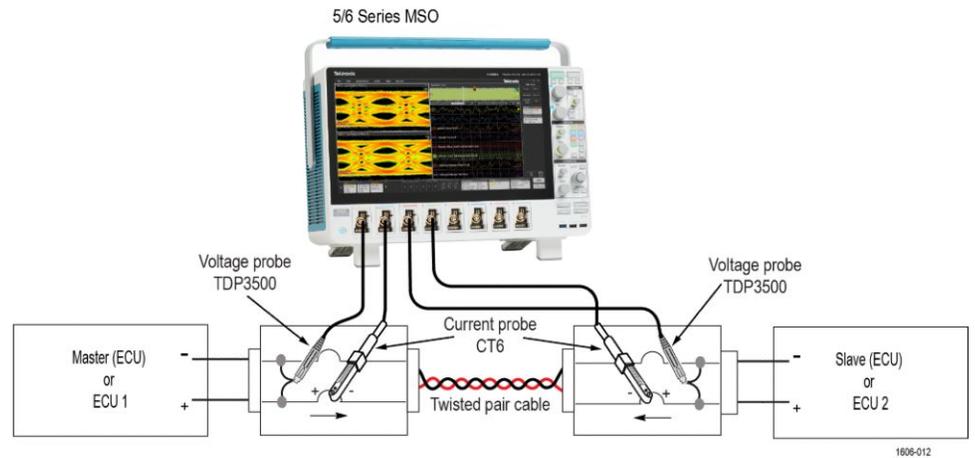


Figure 34: Test setup for 1000BASE-T1 Full Duplex mode using both Master and Slave for One Voltage and One Current

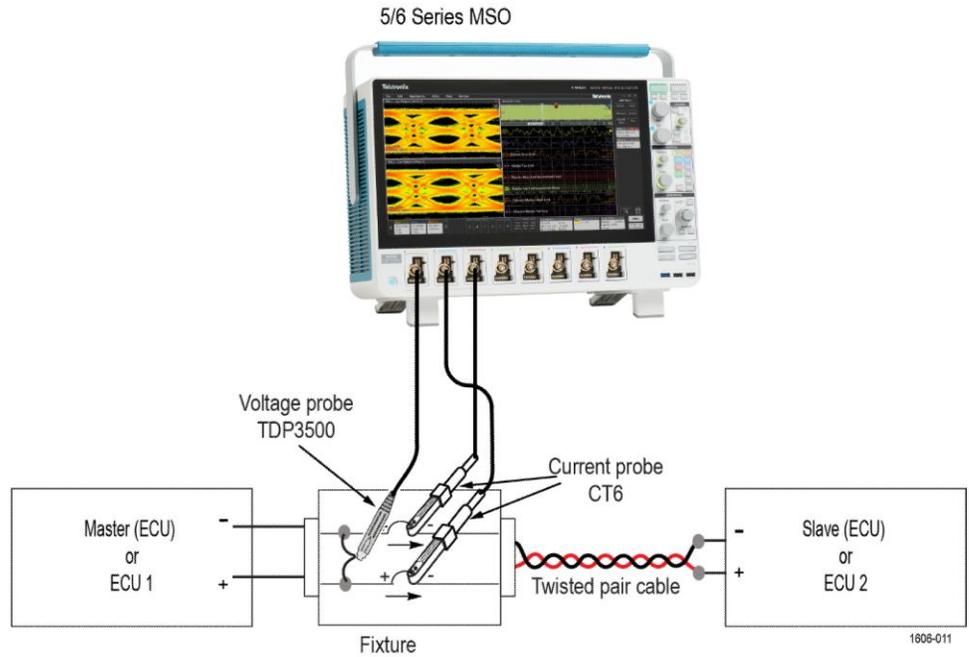


Figure 35: Test setup for 100BASE-T1 Full Duplex mode using Master for One Voltage and Two Current

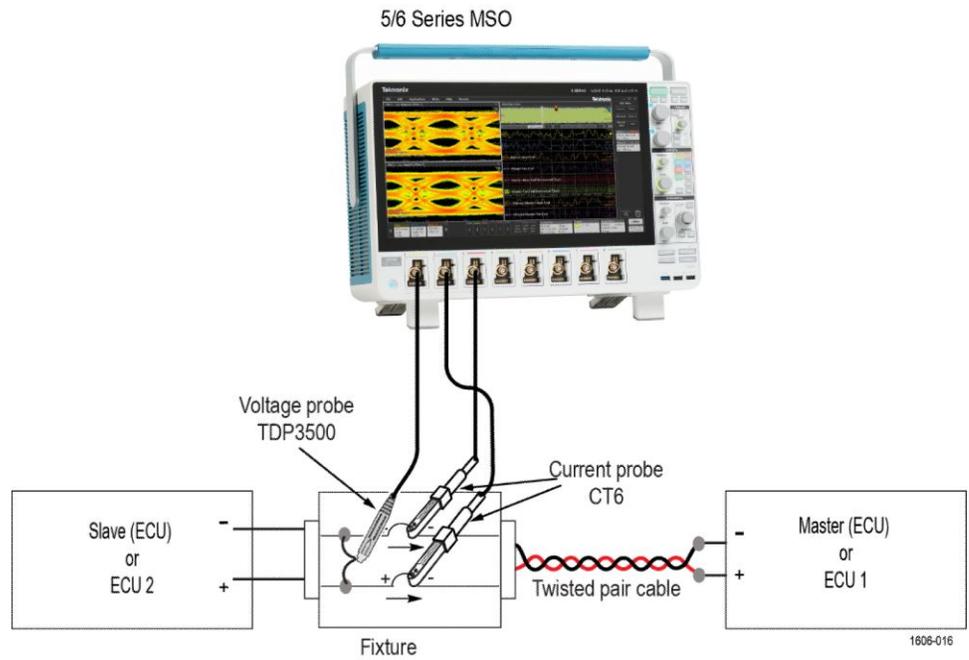


Figure 36: Test setup for 100BASE-T1 Full Duplex mode using Slave for One Voltage and Two Current

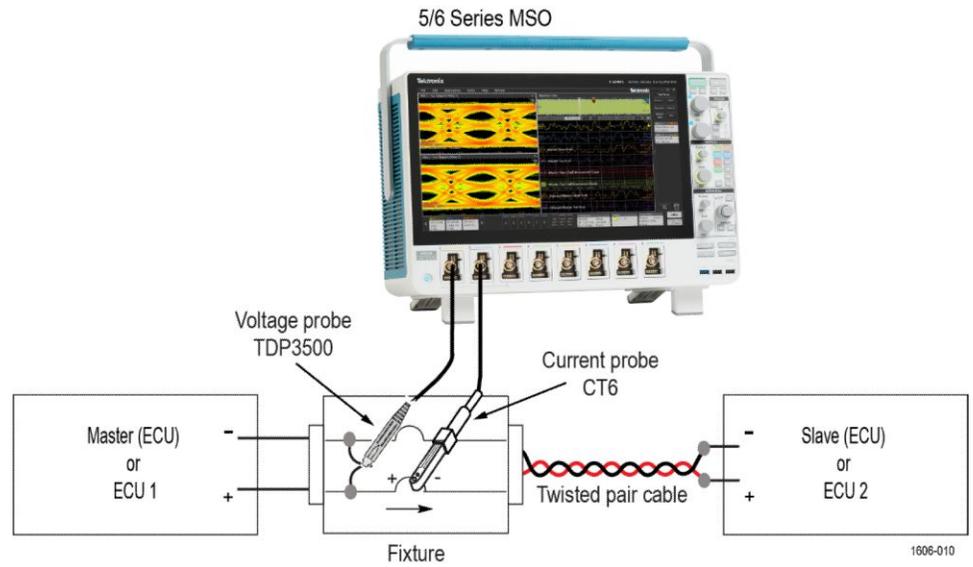


Figure 37: Test setup for 1000BASE-T1 Full Duplex mode using Master for One Voltage and One Current

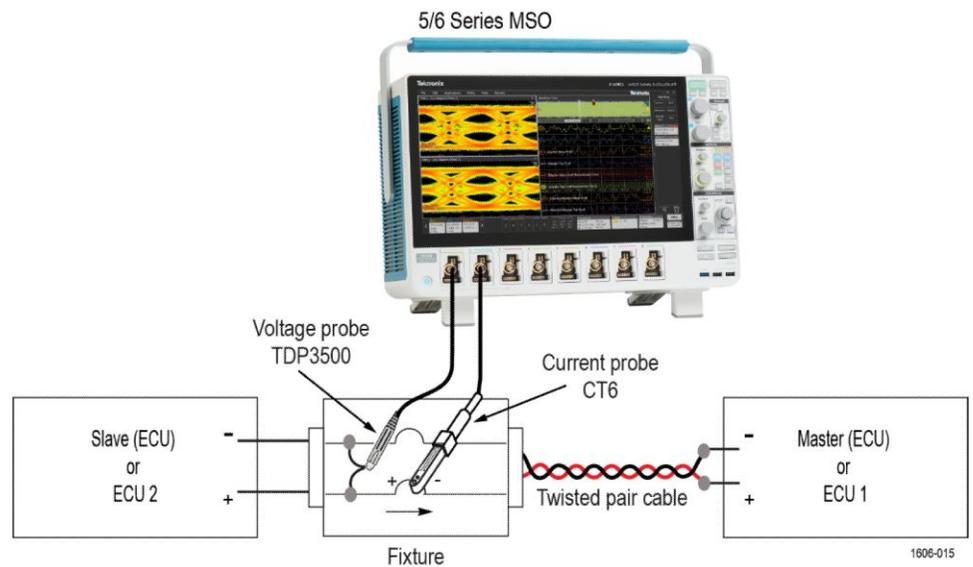


Figure 38: Test setup for 1000BASE-T1 Full Duplex mode using Slave for One Voltage and One Current

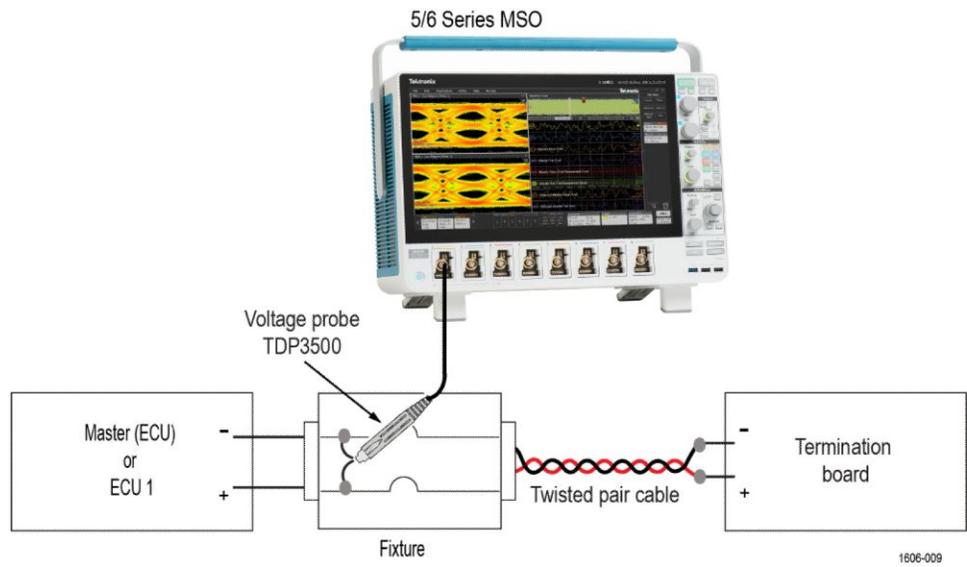


Figure 39: Test setup for 1000BASE-T1 Half Duplex mode using Master for One Voltage

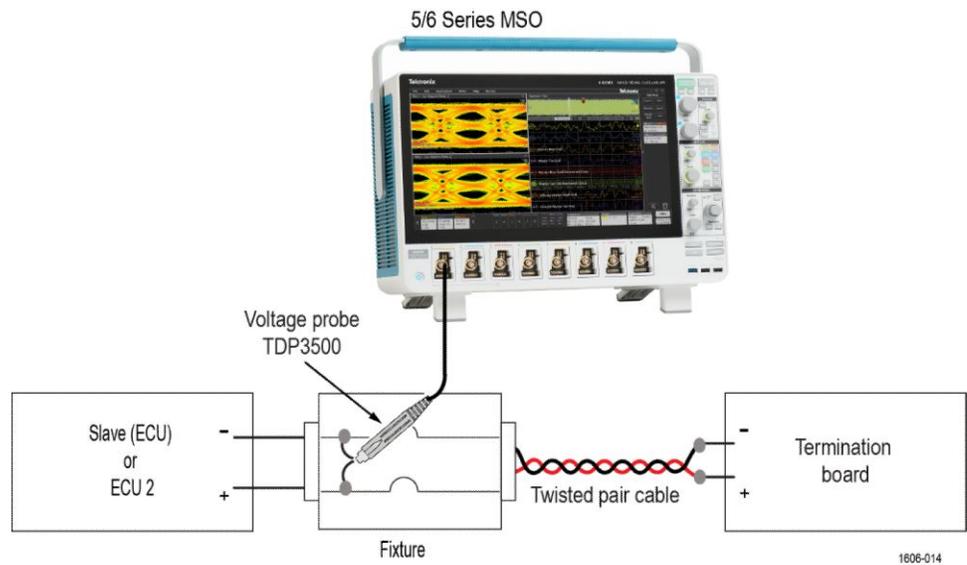


Figure 40: Test setup for 1000BASE-T1 Half Duplex mode using Slave for One Voltage

Compensate the signal path

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

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

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

Running tests

Use *Set DUT parameters*, *select tests*, *set acquisition parameters*, *set configuration parameters*, *set preferences parameters*, and click **Start** to run the tests. While tests are running, you cannot access the Setup or Reports panels. To monitor the test progress, switch between the Status panel and the Results panel.

While tests are running, the other applications will be displayed at the background. If you want the TekExpress Automotive PAM3 Analysis application to run in the foreground select **Keep On Top** from the TekExpress Options menu.

The application displays report when the tests execution is complete.

- Prerun checklist**
1. Make sure that the instruments are warmed up (approximately 20 minutes) and stabilized.
 2. Perform compensation: In the oscilloscope main menu, select **Utilities > Instrument Compensation**. Click **Help** in the compensation window for steps to perform instrument compensation.

View test results

When a test completes, the application switches to the Results panel, which shows a summary of test results.

Each test result occupies a row in the Results table. By default, results are displayed in summary format, with the measurement details collapsed. You can change the view in the following ways:

- To view the results grouped by lane, test, or data rate, select the corresponding item from the Preferences menu.
- To expand all tests listed, select **View Results Details** from the Preferences menu.
- To expand and collapse tests, use the plus and minus buttons to the left of the test rows.
- To collapse all expanded tests, select **Preferences > View Results Summary**.
- To enable or disable the wordwrap feature, select **Preferences > Enable Wordwrap**.
- To expand the width of a column, place the cursor over the vertical line that separates the column from the one to the right. When the cursor changes to a double-ended arrow, hold down the mouse button and drag the column to the desired width.
- To sort the test information by column, click the column head. When sorted in ascending order, a small up arrow is displayed. When sorted in descending order, a small down arrow is displayed.
- To clear all test results displayed, click **Clear** ()

Saving and recalling test setup

Test setup files overview

Saved test setup information (such as the selected oscilloscope, general parameters, acquisition parameters, measurement limits, waveforms (if applicable), and other configuration settings) are saved under the setup name at **X:\TekExpress Automotive PAM3 Analysis**.

Use test setups to:

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

See also [Save a test setup](#)
[Open \(load\) a saved test setup](#)

Save a test setup

You can save a test setup before or after running a test. You can create a test setup from [already created test setup](#), or using [default test setup](#). When you select the default test setup, the parameters are set to the application's default value.

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

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

Open load a saved test setup

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

1. Select **Options > Open Test Setup**.
2. Select the setup from the list and click **Open**. Setup files are located at **X:\TekExpress Automotive PAM3 Analysis**.

See also [About test setups](#)

[Create a test setup using an existing one](#)

[Create a test setup from default settings](#)

Create a test setup from default settings

To create a test setup using default settings, follow the steps:

1. Select **Options > Default Test Setup**. For default test setup, the parameters are set to the application's default value.
2. Click application [Setup](#) and set the parameters
3. Click application [Reports](#) and set the report options
4. Optional: Click **Start** to run the test and verify that it runs correctly and captures the specified test information and reports. If it does not, then edit the parameters and repeat this step until the test runs to your satisfaction
5. Select **Options > Save Test Setup**. Enter the file name and click Save. The application saves the file to X:\Automotive PAM3 Analysis*<session_name>*

Create a test setup using an existing one

To create a test setup using an existing one, follow the steps:

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

SCPI commands

About SCPI command

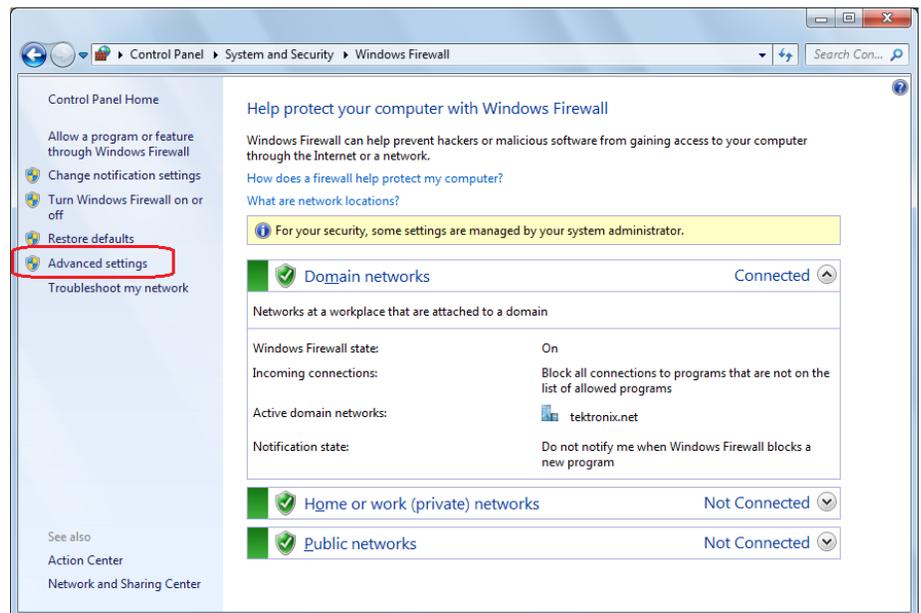
You can use Standard Commands for Programmable Instruments (SCPI) to communicate with the TekExpress application.

Socket configuration for SCPI commands

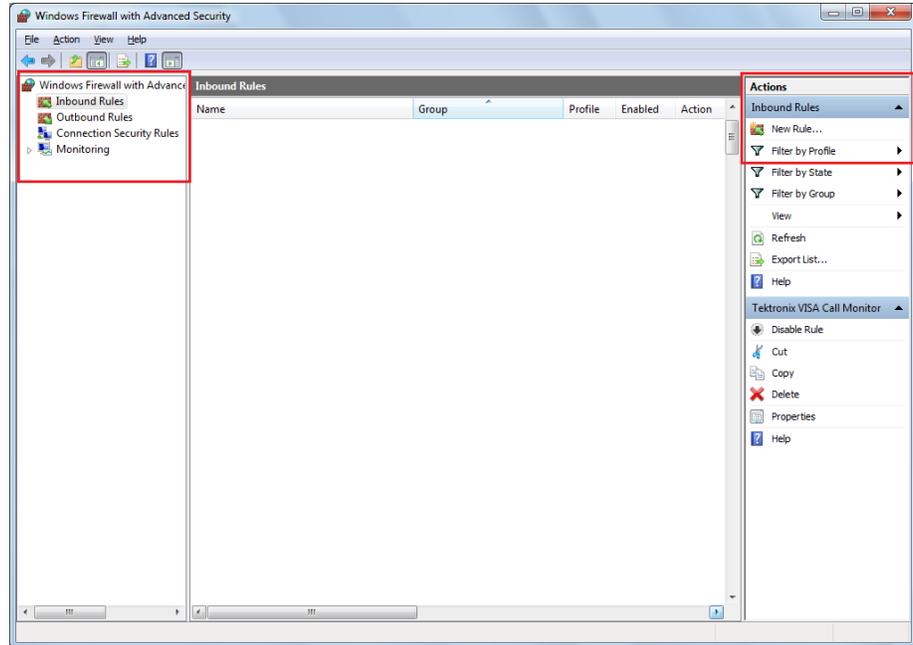
This section describes the steps for TCP/IP socket configuration and TekVISA configuration to execute the SCPI commands.

TCP/IP socket configuration

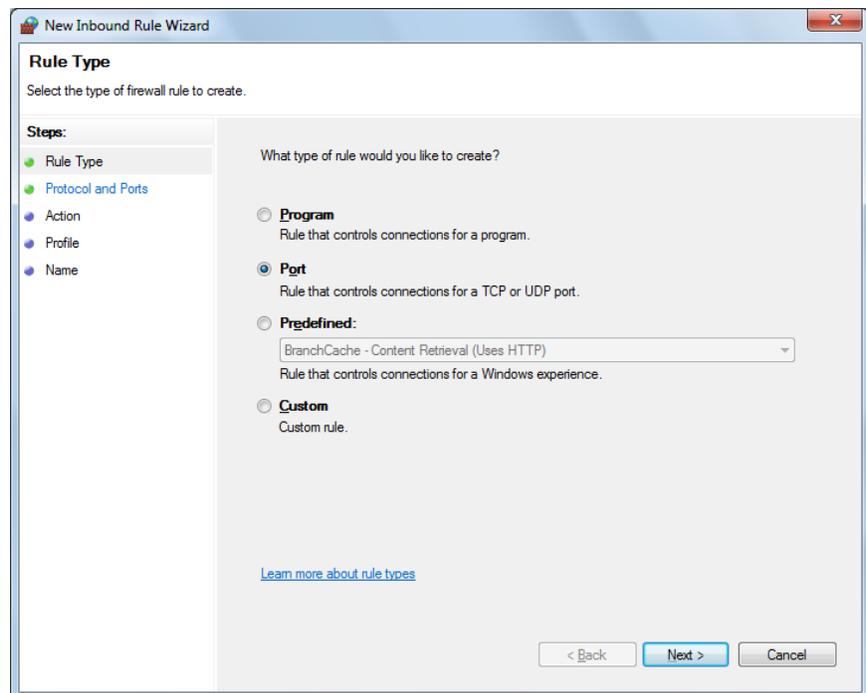
1. Click **Start > Control Panel > System and Security > Windows Firewall > Advanced settings**.



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



3. In New Inbound Rule Wizard menu
 - a. Select **Port** and click **Next**.



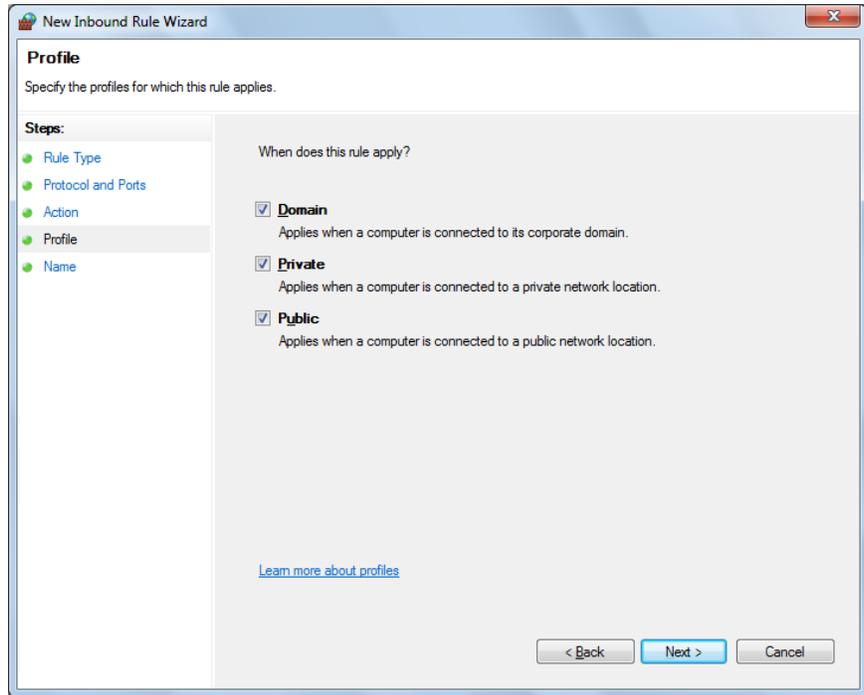
- b. Select **TCP** as rule apply and enter 5000 for **Specific local ports** and click **Next**.

The screenshot shows the 'New Inbound Rule Wizard' dialog box, specifically the 'Protocol and Ports' step. The title bar reads 'New Inbound Rule Wizard'. The main heading is 'Protocol and Ports' with the instruction 'Specify the protocols and ports to which this rule applies.' On the left, a 'Steps:' list shows 'Rule Type', 'Protocol and Ports', 'Action', 'Profile', and 'Name', with 'Protocol and Ports' selected. The main area contains two questions: 'Does this rule apply to TCP or UDP?' with radio buttons for 'TCP' (selected) and 'UDP'; and 'Does this rule apply to all local ports or specific local ports?' with radio buttons for 'All local ports' and 'Specific local ports:' (selected). A text box next to 'Specific local ports:' contains '5000' and an example 'Example: 80, 443, 5000-5010' is shown below it. A link 'Learn more about protocol and ports' is at the bottom left. At the bottom right are buttons for '< Back', 'Next >', and 'Cancel'.

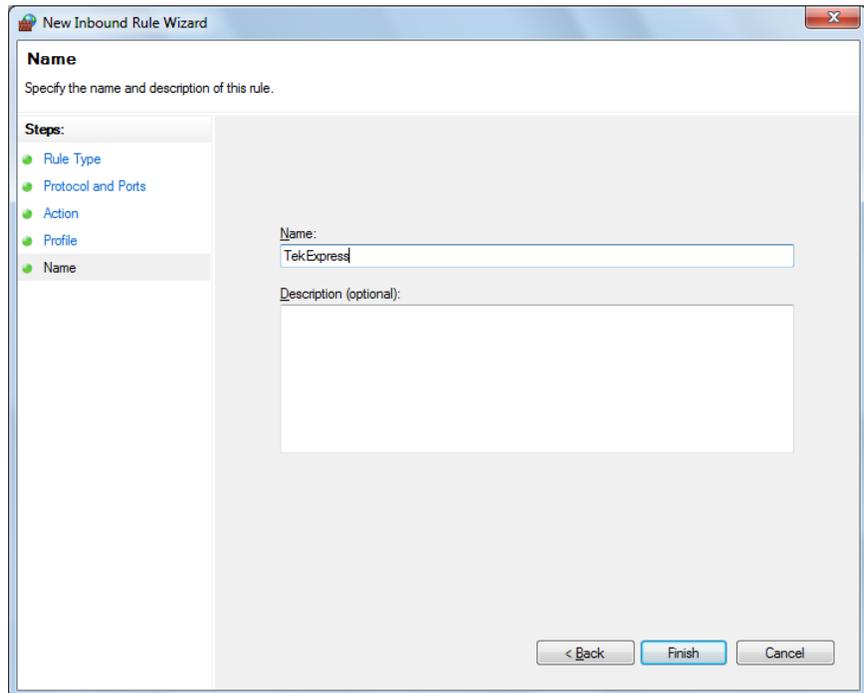
- c. Select **Allow the connection** and click **Next**.

The screenshot shows the 'New Inbound Rule Wizard' dialog box, specifically the 'Action' step. The title bar reads 'New Inbound Rule Wizard'. The main heading is 'Action' with the instruction 'Specify the action to be taken when a connection matches the conditions specified in the rule.' On the left, a 'Steps:' list shows 'Rule Type', 'Protocol and Ports', 'Action', 'Profile', and 'Name', with 'Action' selected. The main area contains the question 'What action should be taken when a connection matches the specified conditions?' with three radio button options: 'Allow the connection' (selected), 'Allow the connection if it is secure', and 'Block the connection'. Descriptions are provided for each option. A 'Customize...' button is located below the 'Allow the connection if it is secure' option. A link 'Learn more about actions' is at the bottom left. At the bottom right are buttons for '< Back', 'Next >', and 'Cancel'.

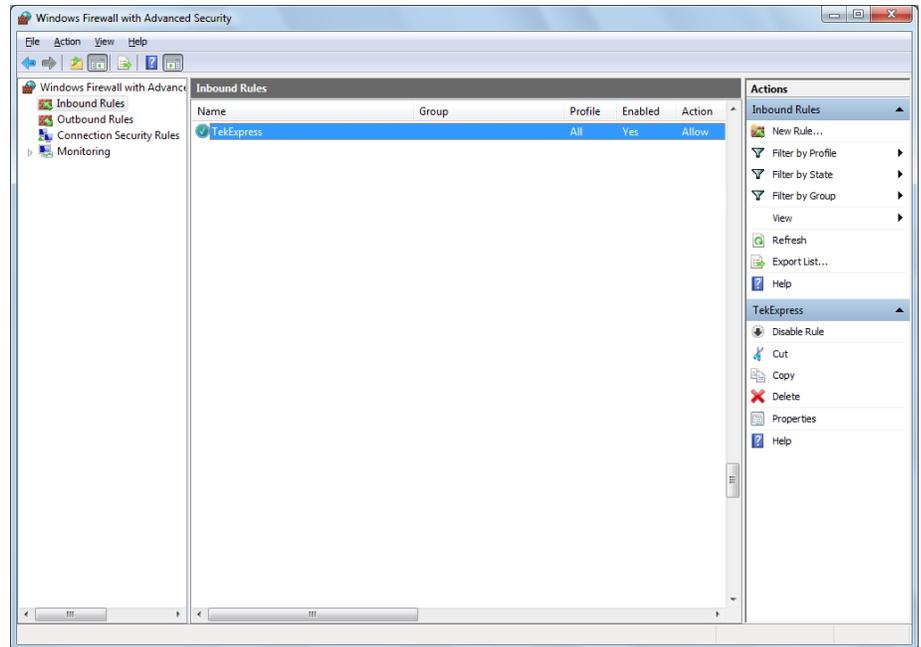
- d. Select **Domain**, **Private**, **Public** and click **Next**.



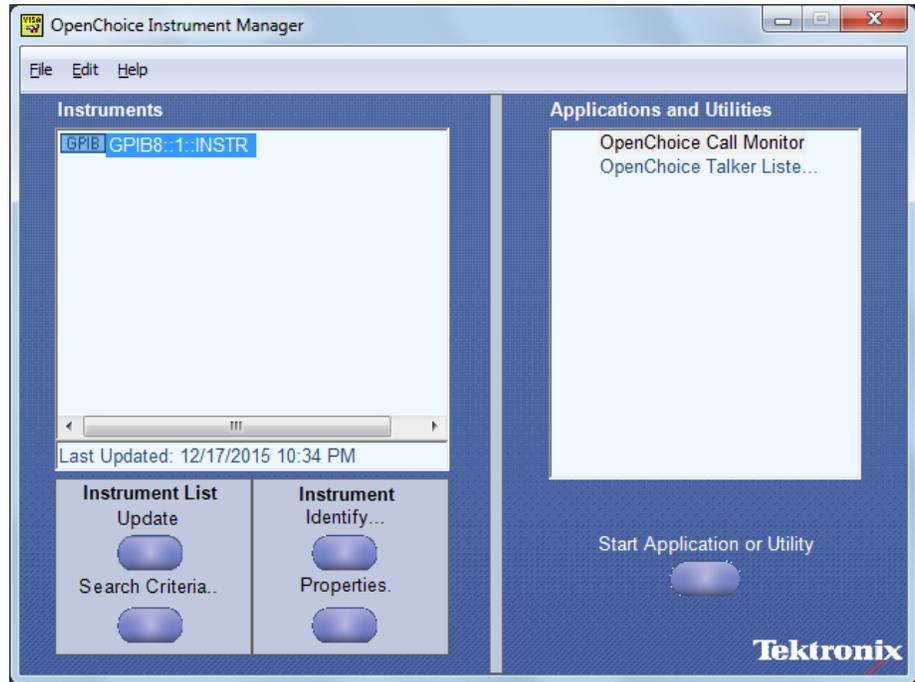
- e. Enter **Name**, Description (optional), and click **Finish**.



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



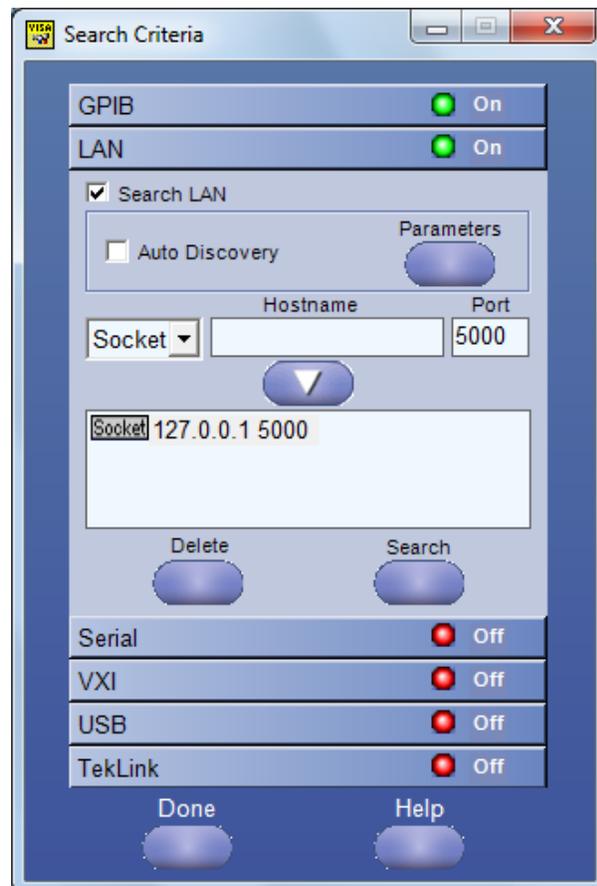
- TekVISA configuration**
1. Click **Start > All Programs > TekVISA > OpenChoice Instrument Manager**.



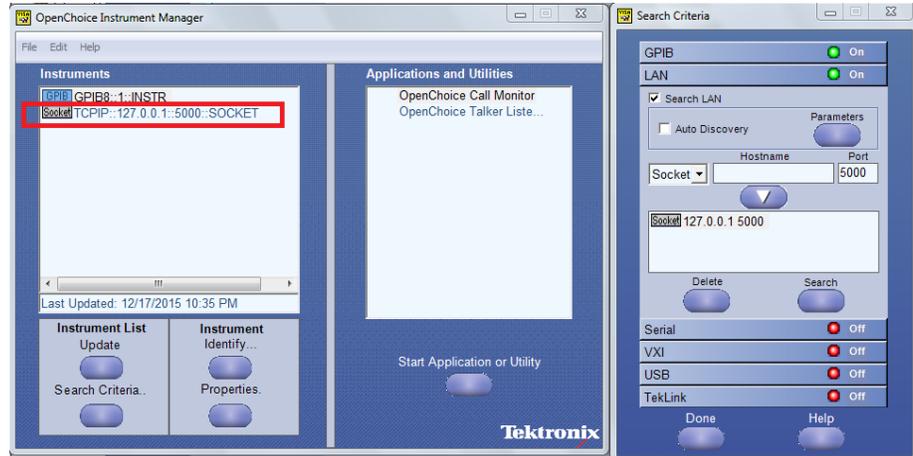
2. Click **Search Criteria**. In Search Criteria menu, click **LAN** to Turn-on. Select **Socket** from the drop-down list, enter the IP address of the

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

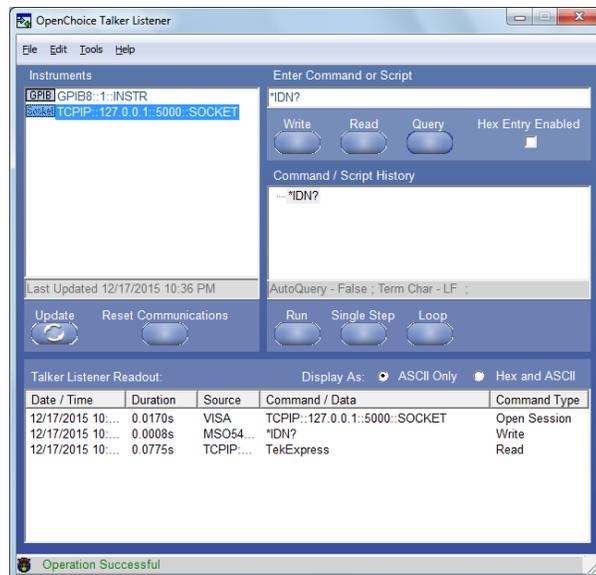
Enter the Hostname as 127.0.0.1 if the TekVISA and TekExpress application are in the same system, else enter the IP address of the TekExpress application system.



- Click **Search** to setup the TCPIP connection with the host. Check whether the TCPIP host name is displayed in **OpenChoice Instrument Manager > Instruments**.



- Double-click **OpenChoice Talker Listener** and enter the Command ***IDN?** in command entry field and click **Query**. Check that the Operation is successful and Talker Listener Readout displays the Command / Data.



TEKEXP:*IDN?

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

Syntax TEKEXP:*IDN?\n

Inputs NA

Outputs Returns active TekExpress application name running on the oscilloscope.

TEKEXP:*OPC?

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

Syntax TEKEXP:*OPC?\n

Inputs NA

Outputs 0 - last command execution is not complete
 1 - last command execution is complete

TEKEXP:ACQUIRE_MODE

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

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

Inputs `{LIVE | PRE-RECORDED}`

Outputs `NA`

TEKEXP:ACQUIRE_MODE?

This command queries the acquire mode type.

Syntax `TEKEXP:ACQUIRE_MODE?\n`

Inputs `NA`

Outputs `{LIVE | PRE-RECORDED}`

TEKEXP:EXPORT

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

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

Inputs FileName - Specifies the file name

TEKEXP:INFO?

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

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

TEKEXP:INSTRUMENT

This command sets the value for the selected instrument type.

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

Inputs InstrumentType
 Value



TIP. Check Command parameters list section for InstrumentType and Value parameters.

Outputs NA

TEKEXP:INSTRUMENT?

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

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

Inputs InstrumentType



TIP. Check Command parameters list section for InstrumentType parameters.

Outputs Returns the instrument selected for the specified instrument type

TEKEXP:LASTERROR?

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

Syntax TEKEXP:LASTERROR?\n

Inputs NA

Outputs <string>

TEKEXP:LIST?

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

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

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

Inputs InstrumentType



TIP. Check Command parameters list section for InstrumentType parameters.

TEKEXP:POPUP

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

Syntax TEKEXP:POPUP "<PopupResponse>"\n

Inputs PopupResponse

Outputs NA

TEKEXP:POPUP?

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

Syntax TEKEXP:POPUP?\n

Inputs NA

Outputs Returns the active popup information in the application.

TEKEXP:REPORT

This command generates the report for the current session.

Syntax TEKEXP:REPORT GENERATE\n

Inputs GENERATE

Outputs NA

TEKEXP:REPORT?

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

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

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



TIP. Check **Report** for HeaderField parameters.

Outputs Returns the queried header field value in the report

TEKEXP:RESULT?

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

Syntax	Outputs
TEKEXP:RESULT? "<TestName>"\n	Return Pass/Fail status of the test.
TEKEXP:RESULT? "<TestName>",<ColumnName>"\n	Returns all the row values of the specified column for the test.
TEKEXP:RESULT? "<TestName>",<ColumnName>",<RowNumber>\n	Returns the column value for the specified row number ¹

- Inputs**
- TestName - Specifies the name of the test for which to obtain the test result value.
 - ColumnName - Specifies the column name for the measurement
 - RowNumber - Specifies the row number of the measurement



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

¹ Row number starts from zero.

TEKEXP:SELECT

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

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

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



TIP. Check Command parameters list section for DeviceName, SuiteName, VersionName, and TestName parameters.

Outputs NA

TEKEXP:SELECT?

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

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

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

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

TEKEXP:SETUP

This command sets the value of the current setup.

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

Inputs SessionName - The name of the session

TEKEXP:STATE

This command sets the execution state of the application.

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

Inputs {RUN | STOP | PAUSE | RESUME}

Outputs NA

TEKEXP:STATE?

This command queries the current setup state.

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

TEKEXP:VALUE

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

Syntax

```
TEKEXP:VALUE GENERAL,"<ParameterName>","<Value>"\n
TEKEXP:VALUE ACQUIRE,"<TestName>","<AcquireType>","
<ParameterName>","<Value>"\n
TEKEXP:VALUE ANALYZE,"<TestName>","<ParameterName>".<Value>"
\n
TEKEXP:VALUE DUTID,"<Value>"\n
TEKEXP:VALUE VERBOSE,{TRUE | FALSE}\n
TEKEXP:VALUE
WFMMFILE,<Test_Name>,<Acquire_Type>,<FileName1$FileName2>\n
```

Inputs

- ParameterName - Specifies the parameter name
- TestName - Specifies the test name
- AcquireType - Specifies the acquire type
- Value - Specifies the value to set
- FileName1\$FileName2 - Specifies the waveform file name
- TRUE - Pop-ups are enabled
- FALSE - Pop-ups are disabled



TIP. Check Command parameters list section for ParameterName, AcquireType, and Value parameters.

Outputs NA

TEKEXP:VALUE?

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

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

- Inputs**
- ParameterName - Specifies the parameter name
 - TestName - Specifies the test name
 - AcquireType - Specifies the acquire type
 - TRUE - Pop-ups are enabled
 - FALSE - Pop-ups are disabled



TIP. Check Command parameters list section for ParameterName and AcquireType parameters.

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

Command parameters list

This section provides the parameters list for the SCPI commands.

Table 20: ParameterName and Value for DUT tab

Parameters	Description	Default value
DUT ID	Specifies the value parameters For DUTID, valid value is: Comment	NA
Acquiremode	Specifies the acquire mode parameters <ul style="list-style-type: none"> ■ Acquire live waveforms ■ Use pre-recorded waveform files 	Acquire live waveforms
Suite	<ul style="list-style-type: none"> ■ 100BASE-T1 ■ 1000BASE-T1 	100BASE-T1
Signal Debug Mode	<ul style="list-style-type: none"> ■ True ■ False <p>Enables Ref and Math. Range for Ref: Ref1 to Ref6 Range for Math: Math1 to Math6</p>	True
Communication Mode	<ul style="list-style-type: none"> ■ Full Duplex ■ Half Duplex 	Full Duplex
Test Point	<ul style="list-style-type: none"> ■ Master ■ Slave ■ Both 	Master
Probes Configuration	<ul style="list-style-type: none"> ■ One voltage and one current ■ One voltage and two current 	One voltage and one current
Master Source Selection		
<i>NOTE. Number of channels will be varied based on the oscilloscope model used. For example, MSO54/64 (4 channels), MSO56 (6 channels) or MSO58 (8 channels).</i>		
Voltage	CH1-CH4	CH1
Current 1	CH1-CH4	CH2
Current 2	CH1-CH4	CH3
Slave Source Selection		
Voltage	CH1-CH4	CH1
Current 1	CH1-CH4	CH2
Current 2	CH1-CH4	CH3

Parameters	Description	Default value
Sample Rate	100BASE-T1 <ul style="list-style-type: none"> ■ .625 ■ 1.5625 ■ 3.125 ■ 6.25 ■ 12.5 ■ 25 ■ 50 1000BASE-T1 <ul style="list-style-type: none"> ■ 1.5625 ■ 3.125 ■ 6.25 ■ 12.5 ■ 25 ■ 50 	3.125 GS/s
Record Length	1 M to 20 M	1 M
Ref Resistance	1 Ohm to 200 Ohms	100 Ohms
Current Loop	<ul style="list-style-type: none"> ■ 1 ■ 2 ■ 3 ■ 4 	1
Search Time	1 ns to 1000 ns	32 ns
Schematic	Displays the schematic as per the communication mode, test point, and the configured probes.	NA
Signal Separation	Signal Separation will be enabled based on the license. Signal debug mode enables Ref and Math.	NA

Table 21: ParameterName and Value for DUT tab-Signal Corrections

Parameter	Description	Default value
Probe settings	100BASE-T1 voltage probe <ul style="list-style-type: none"> ■ TDP1500 ■ TDP3500 100BASE-T1 current probe <ul style="list-style-type: none"> ■ TCP0030A ■ P6022 ■ CT6 1000BASE-T1 voltage probe <ul style="list-style-type: none"> ■ TDP3500 1000BASE-T1 current probe <ul style="list-style-type: none"> ■ CT6 	<ul style="list-style-type: none"> ■ For 100BASE-T1 voltage probe - TDP1500 ■ For 100BASE-T1 current probe - TCP0030A ■ For 1000BASE-T1 voltage probe - TDP3500 ■ For 1000BASE-T1 current probe - CT6
Apply Skew Settings	<ul style="list-style-type: none"> ■ True ■ False 	True
Master Skew Configuration <ul style="list-style-type: none"> ■ Voltage ■ Current 1 ■ Current 2 	Range from -125 to +125 ns	<ul style="list-style-type: none"> ■ 100BASE-T1 <ul style="list-style-type: none"> ■ For TCP0030A: <ul style="list-style-type: none"> ■ Voltage - 0 ns ■ Current1 - 9.2 ns ■ Current2 - 9.2 ns ■ For P6022: <ul style="list-style-type: none"> ■ Voltage - 0 ns ■ Current1 - 5.2 ns ■ Current2 - 5.2 ns ■ For CT6: <ul style="list-style-type: none"> ■ Voltage - 0 ns ■ Current1 - 0 ns ■ Current2 - 0 ns ■ 1000BASE-T1 <ul style="list-style-type: none"> ■ Voltage - 0 ns ■ Current1 - 0 ns ■ Current2 - 0 ns
Slave Skew Configuration <ul style="list-style-type: none"> ■ Voltage ■ Current 1 ■ Current 2 		
Apply Attenuation Settings	<ul style="list-style-type: none"> ■ True ■ False 	False

Parameter	Description	Default value
Master Attenuation Settings <ul style="list-style-type: none"> ■ Voltage ■ Current 1 ■ Current 2 	Range from -200 dB to +200 dB	0
Slave Attenuation Settings <ul style="list-style-type: none"> ■ Voltage ■ Current 1 ■ Current 2 	Range from -200 dB to +200 dB	0
Ratio	Range from 1 to 10	1
Apply Signal Correction	<ul style="list-style-type: none"> ■ True ■ False 	False

Table 22: ParameterName and Value for DUT tab-Clock Recovery and Filter Setup

Parameter	Description	Default value
Baud Mode	<ul style="list-style-type: none"> ■ Auto ■ Manual 	Auto
Manual <ul style="list-style-type: none"> ■ Baud Rate ■ Percentage of Deviation 	<ul style="list-style-type: none"> ■ Baud Rate - 6.66 M Baud/s to 666.66 M Baud/s ■ Percentage of Deviation - 1 to 30 	For 100BASE-T1 : <ul style="list-style-type: none"> ■ Baud rate - 66.66M Baud/s ■ Percentage of Deviation - 5 For 1000BASE-T1 : <ul style="list-style-type: none"> ■ Baud rate - 750 M Baud/s ■ Percentage of Deviation - 5
PLL Model	<ul style="list-style-type: none"> ■ Type1 ■ Type2 	Type1
Type2 <ul style="list-style-type: none"> ■ Damping ■ Loop Bandwidth 	<ul style="list-style-type: none"> ■ Damping - Range 0.45 to 2 ■ Loop Bandwidth - Range 0.1 to 30 MHz 	<ul style="list-style-type: none"> ■ Damping - 0.707 ■ Loop Bandwidth - 1 MHz
CTLE Design	<ul style="list-style-type: none"> ■ 2 Poles + 1 Zero ■ 3 Poles + 2 Zeros 	2 Poles + 1 Zero
ADC	Range from 0.01 to 1	1

Parameter	Description	Default value
F _{Z1} (MHz)	Range from 0.01 to 3000	For 100BASE-T1 : <ul style="list-style-type: none"> ■ F_{Z1} (MHz) - 33.33 MHz For 1000BASE-T1 : <ul style="list-style-type: none"> ■ F_{Z1} (MHz) - 375 MHz
F _{Z2} (MHz)	Range from 0.01 to 3000	For 100BASE-T1 : <ul style="list-style-type: none"> ■ F_{Z1} (MHz) - 46.662 MHz For 1000BASE-T1 : <ul style="list-style-type: none"> ■ F_{Z1} (MHz) - 525 MHz
F _{p1} (MHz)	Range from 0.01 to 3000	For 100BASE-T1 : <ul style="list-style-type: none"> ■ F_{Z1} (MHz) - 133.32 MHz For 1000BASE-T1 : <ul style="list-style-type: none"> ■ F_{Z1} (MHz) - 1500 MHz
F _{p2} (MHz)	Range from 0.01 to 3000	For 100BASE-T1 : <ul style="list-style-type: none"> ■ F_{Z1} (MHz) - 199.98 MHz For 1000BASE-T1 : <ul style="list-style-type: none"> ■ F_{Z1} (MHz) - 2250 MHz
F _{p3} (MHz)	Range from 0.01 to 3000	For 100BASE-T1 : <ul style="list-style-type: none"> ■ F_{Z1} (MHz) - 46.662 MHz For 1000BASE-T1 : <ul style="list-style-type: none"> ■ F_{Z1} (MHz) - 525 MHz
Apply Filters	<ul style="list-style-type: none"> ■ True ■ False 	False
Master/Slave Near End Filter File	X:\Automotive PAM3 Analysis\Filter Files\CTLE	None
Master/Slave Far End Filter File	X:\Automotive PAM3 Analysis\Filter Files\CTLE	None
Apply Inverse PR Shaping Filter	<ul style="list-style-type: none"> ■ True ■ False 	True
Coeff1	Range from 0.01 to 0.99	0.65
Coeff2	Coeff2 value is automatically taken based on the coeff1 value.	
No Of Taps	Range from 3 to 18	12

Table 23: ParameterName and Value for Preferences tab

Parameters	Description	Default value
Number of Runs	1 to 1000	1
Acquire /Analyze each test	True or False	True
On Test Failure pause the test and let me investigate	True or False	False
On Test Failure stop and notify me of the failure	True or False	False
Popup Settings	<ul style="list-style-type: none"> ■ Auto Close Warnings and Informations during Sequencing. Auto Close after (1 to 60) seconds ■ Auto Close Error Message during Sequencing Show in Reports. Auto Close after (1 to 60) seconds ■ Show Messages with a beep sound 	False
Enable Logging	True or False	True

Table 24: ParameterName and Value for Analyze

Test Name	Acquisition Type	Parameter Name	Values	Default value
Eye <ul style="list-style-type: none"> ■ Eye Height ■ Eye Width 	PAM3 Signals	Apply Mask	True or False	False
			Master Near End Mask File	None
			Master Far End Mask File	
			Slave Near End Mask File	
			Slave Far End Mask File	
Jitter <ul style="list-style-type: none"> ■ Random Jitter (DD) ■ Deterministic Jitter (DD) 	PAM3 Signals	Pattern Detection	<ul style="list-style-type: none"> ■ Auto ■ Manual 	Auto
		Pattern Detection->Manual	Pattern Type <ul style="list-style-type: none"> ■ Repeating ■ Arbitrary 	Repeating
		Pattern Type->Repeating	Pattern Length (UI) ranging from 2 to 100000	2
		Pattern Type->Arbitrary	Window Length (UI) range from 2 to 24	10
Jitter <ul style="list-style-type: none"> ■ Total Jitter @ BER 	PAM3 Signals	Pattern Detection	<ul style="list-style-type: none"> ■ Auto ■ Manual 	Auto

Test Name	Acquisition Type	Parameter Name	Values	Default value
		Pattern Detection->Manual	Pattern Type <ul style="list-style-type: none"> ■ Repeating ■ Arbitrary 	Repeating
		Pattern Type->Repeating	Pattern Length (UI) ranging from 2 to 100000	2
		Pattern Type->Arbitrary	Window Length (UI) range from 2 to 24	10
		Target BER	2 to 9	6
Timing <ul style="list-style-type: none"> ■ Rise Time ■ Fall Time 	PAM3 Signals	Levels	<ul style="list-style-type: none"> ■ 20%-80% ■ 10%-90% 	20%-80%
Other: Linearity		NA	NA	NA

ParameterName and Value for General and Analyze

Specifies the ParameterName and Value for General and Analyze. The configuration parameters available are not same for measurements.

Table 25: ParameterName and Value for General

ParameterName	Value	Default value
Report Update Mode	<ul style="list-style-type: none"> ■ New ■ Append ■ Replace ■ in previous run, current session ■ in any run, any session 	New
Report name	X:\Automotive PAM3 Analysis\Reports\DUT001.mht	X:\Automotive PAM3 Analysis\Reports\DUT001.mht
Auto increment report name if duplicate	<ul style="list-style-type: none"> ■ True ■ False 	True
Create report automatically at the end of the run	<ul style="list-style-type: none"> ■ True ■ False 	True
Include pass/fail results summary	<ul style="list-style-type: none"> ■ True ■ False 	True
Include detailed results	<ul style="list-style-type: none"> ■ True ■ False 	True
Include plot images	<ul style="list-style-type: none"> ■ True ■ False 	True
Include setup configuration	<ul style="list-style-type: none"> ■ True ■ False 	True
Include complete configuration	<ul style="list-style-type: none"> ■ True ■ False 	False
Include user comments	<ul style="list-style-type: none"> ■ True ■ False 	True
View report after generating	<ul style="list-style-type: none"> ■ True ■ False 	True

ParameterName	Value	Default value
Save As type	<ul style="list-style-type: none">■ Web Archive (*.mht;*.mhtml)■ PDF (*.pdf)■ CSV (*.csv;)	Web Archive (*.mht;*.mhtml)

Examples

This section provides the examples for the SCPI commands.

Example	Description
TEKEXP:*IDN?\n	It returns the active TekExpress application name running on the scope.
TEKEXP:*OPC?\n	It returns the last command execution status.
TEKEXP:ACQUIRE_MODE PRE-RECORDED\n	It sets the acquire mode as pre-recorded.
TEKEXP:ACQUIRE_MODE?\n	It returns LIVE when acquire mode is set to live.
TEKEXP:EXPORT REPORT\n	It returns the report file in bytes. This can be written into another file for further analysis.
TEKEXP:INFO? REPORT\n	It returns "100,"ReportFileName.mht", when 100 is the file size in bytes for the filename ReportFileName.
TEKEXP:INFO? WFM\n	It returns "100,"WfmFileName1.wfm";"200,"WfmFileName2.wfm" when 100 is the filesize in bytes for the filename WfmFileName1.wfm and 200 is the file size in bytes for the filename WfmFileName2.wfm.
TEKEXP:INSTRUMENT "Real Time Scope",MSO56 (GPIB8::1::INSTR)\n	It sets the instrument value as MSO56 (GPIB8::1::INSTR) for the selected instrument type Real Time Scope.
TEKEXP:INSTRUMENT? "Real Time Scope"\n	It returns "MSO56 (GPIB8::1::INSTR), when MSO56 (GPIB8::1::INSTR)" is the selected instrument for the instrument type Real Time Scope.
TEKEXP:LASTERROR?\n	It returns ERROR: INSTRUMENT_NOT_FOUND, when no instrument is found
TEKEXP:LIST? DEVICE\n	It returns "Automotive Ethernet".
TEKEXP:LIST? INSTRUMENT,"Real Time Scope"\n	It returns "MSO56 (GPIB8::1::INSTR),MSO58 (TCPIP:: 134.64.248.91::INSTR)" when MSO64 (GPIB8::1::INSTR), MSO58 (TCPIP:: 134.64.248.91::INSTR) are the list of available instruments
TEKEXP:POPOP "OK"\n	It sets OK as the response to active popup in the application.
TEKEXP:POPOP?\n	It returns "OK", when OK is the active popup information shown in the application.
TEKEXP:REPORT GENERATE\n	It generates report for the current session.
TEKEXP:REPORT? "TekScope Model"\n	It returns "MSO56" when MSO56 is the scope model.
TEKEXP:REPORT? "DUT ID"\n	It returns "DUT001" when DNI_DUT001 is the DUT ID.
TEKEXP:RESULT? "Eye Height"\n	It returns Pass, then the test result is Pass.
TEKEXP:RESULT? "Eye Height","Margin"\n	It returns "N.A" when Margin value is N.A.
TEKEXP:SELECT? DEVICE Automotive Ethernet\n	It selects Automotive Ethernet.
TEKEXP:SELECT? DEVICE\n	It returns " Automotive Ethernet ".

Example	Description
TEKEXP:SETUP DEFAULT\n	It restores the application to default setup.
TEKEXP:STATE STOP\n	It stops the test execution.
TEKEXP:STATE?\n	It returns as READY when the application is ready to run next measurement.
TEKEXP:STATE? SETUP\n	It returns as NOT_SAVED when the current setup is not saved.
TEKEXP:VALUE GENERAL, "Communication Mode", "Full Duplex"\n	It sets the communication mode as full duplex.
TEKEXP:VALUE? GENERAL, "Communication Mode"\n	It returns communication mode as full duplex.
TEKEXP:SELECT TEST , "Eye Height", True	Execute this command to select an individual test. This command will select " Eye Height " test in the Signal Test tab.

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