Keysight D90203DJC IEEE 802.3 dj Compliance Application

KEYSIGHT

PROGRAMMER'S REFERENCE

Notices

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CAUTION

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A WARNING notice denotes a hazard. It calls attention to an operating procedure, practice, or the like that, if not correctly performed or adhered to, could result in personal injury or death. Do not proceed beyond a WARNING notice until the indicated conditions are fully understood and met.

In This Book

This book is your guide to programming the Keysight Technologies D90203DJC IEEE 802.3 dj Compliance Application.

- Chapter 1, “Introduction to Programming,” starting on page 7, describes compliance application programming basics.
- Chapter 2, “Configuration Variables and Values,” starting on page 9, Chapter 3, “Test Names and IDs,” starting on page 19, and Chapter 4, “Instruments,” starting on page 27 provide information specific to programming the D90203DJC IEEE 802.3 dj Compliance Application.

How to Use This Book

Programmers who are new to compliance application programming should read all of the chapters in order. Programmers who are already familiar with this may review chapters 2, 3, and 4 for changes.

Contents

1 Introduction to Programming

This chapter introduces the basics for remote programming a compliance/test application. The programming commands provide the means of remote control. Basic operations that you can do remotely with a computer and a compliance/test app running on an oscilloscope include:

- Launching and closing the application.
- Configuring the options.
- Running tests.
- Getting results.
- Controlling when and were dialogs get displayed
- Saving and loading projects.

You can accomplish other tasks by combining these functions.

Remote Programming Toolkit

The majority of remote interface features are common across all the Keysight Technologies, Inc. family of compliance/test applications. Information on those features is provided in the N5452A Compliance Application Remote Programming Toolkit available for download from Keysight here: www.keysight.com/find/rpi. The D90203DJC IEEE 802.3 dj Compliance Application uses Remote Interface Revision 7.30. The help files provided with the toolkit indicate which features are supported in this version.

In the toolkit, various documents refer to "application-specific configuration variables, test information, and instrument information". These are provided in Chapters 2, 3, and 4 of this document, and are also available directly from the application's user interface when the remote interface is enabled (View>Preferences::Remote tab::Show remote interface hints). See the toolkit for more information.

2 Configuration Variables and Values

The following table contains a description of each of the D90203DJC IEEE 802.3 dj Compliance Application options that you may query or set remotely using the appropriate remote interface method. The columns contain this information:

- GUI Location – Describes which graphical user interface tab contains the control used to change the value.
- Label – Describes which graphical user interface control is used to change the value.
- Variable – The name to use with the SetConfig method.
- Values – The values to use with the SetConfig method.
- Description – The purpose or function of the variable.

For example, if the graphical user interface contains this control on the **Set Up** tab:

- Enable Advanced Features

then you would expect to see something like this in the table below:

Table 1 Example Configuration Variables and Values

GUI Location	Label	Variable	Values	Description
Set Up	Enable Advanced Features	EnableAdvanced	True, False	Enables a set of optional features.

and you would set the variable remotely using:

```
ARSL syntax
-----------
arsl -a ipaddress -c "SetConfig 'EnableAdvanced' 'True'"

C# syntax
```

```
---------
remoteAte.SetConfig("EnableAdvanced", "True");
```

Here are the actual configuration variables and values used by this application:

NOTE Some of the values presented in the table below may not be available in certain configurations. Always perform a "test run" of your remote script using the application's graphical user interface to ensure the combinations of values in your program are valid.

NOTE The file, "ConfigInfo.txt", which may be found in the same directory as this help file, contains all of the information found in the table below in a format suitable for parsing.

Table 2 Configuration Variables and Values

GUI Location	Label	Variable	Values	Description
Configure	Bandwidth	BW	(Accepts user-defined text), 60e9	Enter the scope bandwidth.
Configure	Clock Recovery Method	CRMethod	FOPLL, SOPLL	Select the Cock Recovery Method to be used.
Configure	Damping Factor	DFactor	(Accepts user-defined text), 1	Enter the Damping Factor to use for clock recovery. This values is only used for Second Order PLL. You may enter any value.
Configure	Disable Pattern Check	DisablePattern	Enable, Disable	Select "Disable" to disable the pattern verification for square 8 pattern tests and suppress pattern error pop-ups. Select "Enable" to ensure that the correct pattern is being tested as per specification.
Configure	Disable SNDR Pre-requisites	DisSNDRPre	Enabled, Disabled	Sigma n and ES1/ES2 are pre-requisite measurements to SNDR. If you want to skip these pre-requisites and enter a user sigma-n value, Select "Disable". ES1/ES2 will be set to 0.33.
Configure	Dp	DpVal	(Accepts user-defined text), 2, 3, 4	Set the Dp value used for steady state, linear fit pulse peak, and error calculations.

Table 2 Configuration Variables and Values (continued)

GUI Location	Label	Variable	Values	Description
Configure	Eye Gaussian Standard Deviation	EyeStd	(Accepts user-defined text), 2	Select or set the standard deviation used in eye measurements (EH, EW, VEC) when gaussian window shape is used.
Configure	Eye Height/Width Probability	NumUI	(Accepts user-defined text), 1e-5, 1e-6, 1e-15	Select the eye probability to test to for Eye Height and Width tests.
Configure	Eye Level Width	EyeLevWidth	(Accepts user-defined text), 5, 10	Select the eye level width used in eye measurements (EH, EW, VEC).
Configure	Eye Window Shape	EyeWinShape	GAUSsian, BOXCar	Select the eye window shape used in eye measurements (EH, EW, VEC).
Configure	Find Scope Optimal FFE	ScopeOptFFE	OFF, ON	Select to automatically find the optimal FFE with the scope at the start of the run. Use Test Tx FFE source to set whether FFE will be applied in the scope or the Tx. Note: this is not used for auto-tune. This is for debugging only using FFE for testing.
Configure	Host Designation	HostDesign	HostLow, HostNominal, HostHigh	Choose a host designation. Host-Low, Host-Nominal, and Host-High correspond to low, moderate, and high levels of insertion loss, respectively.
Configure	Jitter Edge Count	JitCount	(Accepts user-defined text), 200, 10000	Set the number of edges for jitter to start measuring results. Note: lower value than the default of 10000 will not be as accurate and consistent. However, will enable quick results.
Configure	Jitter Pattern	JitPat	(Accepts user-defined text), P9Q, P13Q, Other	Select PRBS13Q or PRBS9Q to test jitter. Select Other for PRBS13Q pattern that not only swapped the 3/2 (as defined by grey code), but also the 0/1.

Table 2 Configuration Variables and Values (continued)

GUI Location	Label	Variable	Values	Description
Configure	Loop Bandwidth	LoopBandwidth	(Accepts user-defined text), 4e6, 10e6, 10.3035e6	Enter the loop bandwidth to use for clock recovery. Value with automatically scale with signaling rate change. Manually set to desired value if different from autoset.
Configure	Nb	NbVal	(Accepts user-defined text), 1, 6, 10, 12, 13, 14, 16	Set the Nb value used for steady state, linear fit pulse peak, and error calculations.
Configure	NbSNRISI	NbSNRISIVal	(Accepts user-defined text), 6, 10, 12, 13, 14, 16, 20	Set the Nb value used for SNRISI calculations.
Configure	Np	NpVal	(Accepts user-defined text), 8, 12, 13, 14, 29, 200, 400	Set the Np value used for used for SNDR and SNR_ISI calculations.
Configure	Number of FFE Precursor Taps	NumFFEPre	(Accepts user-defined text), 5	Specify the total number of FFE Precursor Taps. The number of Postcursor Taps will be (NumTapsFFE - NumPreTapsFFE - 1). The minus one is due to Tap 0.
Configure	Number of FFE Taps	NumFFETaps	(Accepts user-defined text), 29	Specify the total number of FFE Taps including Tap 0
Configure	Nv	NvVal	(Accepts user-defined text), 8, 12, 13, 14, 29, 200, 400	Set the Nv value used for steady state, linear fit pulse peak, and error calculations.
Configure	Sample Rate	SR	(Accepts user-defined text), 256e9	Enter the scope sample rate.
Configure	Save Tested Waveforms	SaveWFM	No, Yes	Select Yes to save the waveform files of the tested signals. Files will be saved to directory set in Select waveform directory.

Table 2 Configuration Variables and Values (continued)

GUI Location	Label	Variable	Values	Description
Configure	Scope Response	ScopeResp	BESSEL4, BUTT, WALL	Select the Scope Response. A selection of 4th order Bessel will better represent a reference reciever. A flat response will give a direct look at the exact signal at the test point.
Configure	Scope Response 3dB frequency	ScopeFreq	(Accepts user-defined text), 33e9, 40e9, 43e9, 50e9, 60e9, 63e9, 80e9	Select the Scope Response 3dB frequency. Note: a selection of 75% of Baud Rate will automatically calculate the valued based on the Baud Rate.
Configure	Select Preset for SNDR/RLM	PresetSNDRRLM	1, 2, 3, 4, 5	Select the Preset that is desired for the SNDR/RLM Test. *NOTE: This settings is not applicable for Offline Run. Only Preset 1 is available for Offline Run.
Configure	Select Waveform Directory	DirWFM	(Accepts user-defined text), C:\Temp\IEEEwfm	Type in a directory path to save your measured waveforms.
Configure	Sigma N	SigmaN	(Accepts user-defined text), 2e-3	Enter the value to use for Sigma N. This value will be used when SNDR pre-req are disabled. Format 0.002 or 2e-3.
Configure	Signal Channels	CHANPAIR	1, 2, Channel 1 and 2, Channel 3 and 4, CHANnel1, CHANnel2, CHANnel3, CHANnel4, 3, 4, WMEMory1, WMEMory2, WMEMory3, WMEMory4, FUNCtion1, FUNCtion2, FUNCtion3, FUNCtion4	Select the oscllloscope input channel pair if connected dual single-ended. Or select the channel used for differential connection. All single channel, waveform memories, or functions that contain the word "differential", must be a single probe or signal that is differential. The channel or waveform memories with two channels are for dual single-ended connections. Note: All functions must be differential.
Configure	Signaling Rate	SignalingRate	(Accepts user-defined text), 10.3125e9, 25.78125e9, 26.5625e9, 53.125e9, 106.25e9	Set the Signaling Rate to be tested. Enter value in the format 10.3125e9.

Table 2 Configuration Variables and Values (continued)

GUI Location	Label	Variable	Values	Description
Configure	Test Tx FFE source	FFESource	Scope, DUT	Select where FFE is applied for eye tests. Optimal transmitter FFE is calcuated during Auto-tune. User can select to have the scope use the values found, or set DUT FFE.
Configure	Tfx Delay for TP1a	TfxTP1a	(Accepts user-defined text), 0	Select the value of fixture delay time for TP1a. This is for ERL measurement. The fixture delay time (Tfx) is twice the propagation delay in ns associated with the test fixture. Please enter value in the format 2e-9.
Configure	Tfx Delay for TP2	TfxTP2	(Accepts user-defined text), 0	Select the value of fixture delay time for TP2. This is for ERL measurement. The fixture delay time (Tfx) is twice the propagation delay in ns associated with the test fixture. Please enter value in the format 2e-9.
Configure	Tfx Delay for TP4	TfxTP4	(Accepts user-defined text), 0	Select the value of fixture delay time for TP4. This is for ERL measurement. The fixture delay time (Tfx) is twice the propagation delay in ns associated with the test fixture. Please enter value in the format 2e-9.

Table 2 Configuration Variables and Values (continued)

GUI Location	Label	Variable	Values	Description
Configure	Tx pattern	SNDRPat	PRBS13Q, PRBS13Qu, Other, OtherInv	Select the pattern to be used for SNDR, Coefficient, and DFE calculations. NOTE: This pattern is NOT for Jitter measurements. Due to specific edge definitions for the 12 edges, PRBS13Q grey code or PRBS9Q gray code are required. Use jitter pattern configuration for jitter selection. "PRBS13Q" is the specified PRBS13Q grey code signal. "PRBS13Q Uncoded" is PRBS13Q uncoded. "Other" is a PRBS13Q pattern that not only swapped the 3/2 (as defined by grey code), but also the 0/1. "Other Inv" is the inverse of "Other"
Configure	Use Optimized CTLE gDC for Eye Opening TP1a.	UseCTLE	0, -1, -2, -3, -4, -5, -6, -7, -8, -9, -10	Select the optimized setting to use. Default is off. Run "Auto-tune" Test under "Utilities" to find the optimal setting. When the utility is run, it will automatically set the optimal setting. This value will only be automatically set if utility is run any time after app load or if project is loaded with setting. All other instances, the setting will be the default of off and will need to be manually selected.
Configure	Use Optimized CTLE gDC for Far-end Eye Opening TP4 Short.	UseFarCTLE	0, -1, -2, -3, -4, -5, -6, -7, -8, -9, -10	Select the optimized setting to use. Default is off. Run "Auto-tune" Test under "Utilities" to find the optimal setting. When the utility is run, it will automatically set the optimal setting. This value will only be automatically set if utility is run any time after app load or if project is loaded with setting. All other instances, the setting will be the default of off and will need to be manually selected.

Table 2 Configuration Variables and Values (continued)

GUI Location	Label	Variable	Values	Description
Configure	Use Optimized CTLE gDC for Far-end Eye Opening TP4.	UseFarCTLE	0, -1, -2, -3, -4, -5, -6, -7, -8, -9, -10	Select the optimized setting to use. Default is off. Run "Auto-tune" Test under "Utilities" to find the optimal setting. When the utility is run, it will automatically set the optimal setting. This value will only be automatically set if utility is run any time after app load or if project is loaded with setting. All other instances, the setting will be the default of off and will need to be manually selected.
Configure	Use Optimized CTLE gDC for Near-end Eye Opening TP4.	UseNearCTLE	0, -1, -2, -3, -4, -5, -6, -7, -8, -9, -10	Select the optimized setting to use. Default is off. Run "Auto-tune" Test under "Utilities" to find the optimal setting. When the utility is run, it will automatically set the optimal setting. This value will only be automatically set if utility is run any time after app load or if project is loaded with setting. All other instances, the setting will be the default of off and will need to be manually selected.
Configure	Use Optimized CTLE gDC2 for Eye Opening TP1a.	UseCTLEgDC2	0, -1, -2, -3, -4, -5	Select the optimized setting to use. Default is off. Run "Auto-tune" Test under "Utilities" to find the optimal setting. When the utility is run, it will automatically set the optimal setting. This value will only be automatically set if utility is run any time after app load or if project is loaded with setting. All other instances, the setting will be the default of off and will need to be manually selected.

Table 2 Configuration Variables and Values (continued)

GUI Location	Label	Variable	Values	Description
Configure	Use Optimized CTLE gDC2 for Far-end Eye Opening TP4 Short.	UseFarCTLEgDC2	0, -1, -2, -3, -4, -5	Select the optimized setting to use. Default is off. Run "Auto-tune" Test under "Utilities" to find the optimal setting. When the utility is run, it will automatically set the optimal setting. This value will only be automatically set if utility is run any time after app load or if project is loaded with setting. All other instances, the setting will be the default of off and will need to be manually selected.
Configure	Use Optimized CTLE gDC2 for Far-end Eye Opening TP4.	UseFarCTLEgDC2	0, -1, -2, -3, -4, -5	Select the optimized setting to use. Default is off. Run "Auto-tune" Test under "Utilities" to find the optimal setting. When the utility is run, it will automatically set the optimal setting. This value will only be automatically set if utility is run any time after app load or if project is loaded with setting. All other instances, the setting will be the default of off and will need to be manually selected.
Configure	Use Optimized CTLE gDC2 for Near-end Eye Opening TP4.	UseNearCTLEgDC2	0, -1, -2, -3, -4, -5	Select the optimized setting to use. Default is off. Run "Auto-tune" Test under "Utilities" to find the optimal setting. When the utility is run, it will automatically set the optimal setting. This value will only be automatically set if utility is run any time after app load or if project is loaded with setting. All other instances, the setting will be the default of off and will need to be manually selected.

Table 2 Configuration Variables and Values (continued)

GUI Location	Label	Variable	Values	Description
Configure	Use Predifined Function	UseFunc	Chan, FUNCtion1, FUNCtion3, FUNCtion4, FUNCtion5, FUNCtion6	This gives the option to use a function that the user sets up. Select the function the user has set. The app will skip default setup and scaling. Please ensure that the function you are using is properly scaled before starting run. Note: Function2 is used by the app, do not include Function 2 in your setup.
Configure	Use Scope Cal	ScopeCal	Y, N	Select Yes to use scope calibration. No, to not. This is automatically set to Yes when a scope cal is run on the setup tab.
Run Tests	Event	RunEvent	(None), Fail, Margin < N, Pass	Names of events that can be used with the StoreMode=Event or RunUntil RunEventAction options
Run Tests	RunEvent=Margin < N: Minimum required margin %	RunEvent_Margin < N_MinPercent	Any integer in range: 0 <= value <= 99	Specify N using the 'Minimum required margin %' control.
Set Up	Channel Pairs Option	ChanPairOpt	Channels 1 and 2, Channels 3 and 4	This option allows user to select which channel pair is being used for test. Note: Selecting main channels will bandwidth limit your signal, please select correct channels for signal you are measuring. Select Channel Pairs Option
Set Up	OfflineEnable	OfflineEnable	0.0, 1.0	Enable testing using saved waveforms.
Set Up	automate the ERL browse button		1	Browse the path to load the required ERL file Setup the ERL file
Set Up	automate the ERL clear button	ClearS4PERLFilePath	1	Clear the entry of ERL file path Clear the ERL file entry
Set Up	automate the Fixture Ref browse button		1	Browse the path to load the required reference fixture file Setup the Fixture Ref file
Set Up	automate the Fixture Ref clear button	ClearFixRefFilePath	1	Clear the entry of Fixture Ref file path Clear the Fixture Ref file entry

3 Test Names and IDs

The following table shows the mapping between each test's numeric ID and name. The numeric ID is required by various remote interface methods.

- Name – The name of the test as it appears on the user interface **Select Tests** tab.
- Test ID – The number to use with the RunTests method.
- Description – The description of the test as it appears on the user interface **Select Tests** tab.

For example, if the graphical user interface displays this tree in the **Select Tests** tab:

- All Tests
  - Rise Time
  - Fall Time

then you would expect to see something like this in the table below:

Table 3 Example Test Names and IDs

Name	Test ID	Description
Fall Time	110	Measures clock fall time.
Rise Time	100	Measures clock rise time.

and you would run these tests remotely using:

```
ARSL syntax
-----------
arsl -a ipaddress -c "SelectedTests '100,110'"
arsl -a ipaddress -c "Run"

C# syntax
---------
remoteAte.SelectedTests = new int[]{100,110};
remoteAte.Run();
```

Here are the actual Test names and IDs used by this application. Listed at the end, you may also find:

- Deprecated IDs and their replacements.
- Macro IDs which may be used to select multiple related tests at the same time.

NOTE The file, "TestInfo.txt", which may be found in the same directory as this help file, contains all of the information found in the table below in a format suitable for parsing.

Table 4 Test IDs and Names

Name	TestID	Description
AC Common Mode Voltage, Full-band VCMFB	113002	Test the AC common mode voltage, full band. This test can only be tested in dual single ended connection
AC Common Mode Voltage, Full-band VCMFB	123002	Test the AC common mode voltage, full band. This test can only be tested in dual single ended connection
AC Common Mode Voltage, Full-band VCMFB	203003	Test the AC common mode voltage, full band. This test can only be tested in dual single ended connection
AC Common Mode Voltage, Low-frequency VCMLF	113001	Test the AC common mode voltage, low-frequency, 100MHz low-pass filter. This test can only be tested in dual single ended connection
AC Common Mode Voltage, Low-frequency VCMLF	123001	Test the AC common mode voltage, low-frequency, 100MHz low-pass filter. This test can only be tested in dual single ended connection
AC Common Mode Voltage, Low-frequency VCMLF	203002	Test the AC common mode voltage, low-frequency, 100MHz low-pass filter. This test can only be tested in dual single ended connection
Auto-tune CTLE, FFE, DFE Eye Opening TP1a	130000	Measures the eye height VEC with CTLE, FFE, and DFE settings for TP1a and reports the optimal settings to use in Eye measurements. The optimal values are automatically set in the configure tab after this test has run.
Auto-tune Far-end CTLE, FFE, DFE Eye Opening TP4	130002	Measures the eye height VEC with CTLE, FFE, and DFE settings for TP4 Far-end and reports the optimal settings to use in Eye measurements. The optimal values are automatically set in the configure tab after this test has run.
Auto-tune Near-end CTLE, FFE, DFE Eye Opening TP4	130001	Measures the eye height VEC with CTLE, FFE, and DFE settings for TP4 Near-end and reports the optimal settings to use in Eye measurements. The optimal values are automatically set in the configure tab after this test has run.
Coefficient Initialization Preset 2 c(-1)	111202	Measures the the coefficients for Preset 2 c(-1)
Coefficient Initialization Preset 2 c(-1)	121202	Measures the the coefficients for Preset 2 c(-1)
Coefficient Initialization Preset 2 c(-1)	201202	Measures the the coefficients for Preset 2 c(-1)

Table 4 Test IDs and Names (continued)

Name	TestID	Description
Coefficient Initialization Preset 2 c(-2)	111201	Measures the the coefficients for Preset 2 c(-2)
Coefficient Initialization Preset 2 c(-2)	121201	Measures the the coefficients for Preset 2 c(-2)
Coefficient Initialization Preset 2 c(-2)	201201	Measures the the coefficients for Preset 2 c(-2)
Coefficient Initialization Preset 2 c(-3)	111200	Measures the the coefficients for Preset 2 c(-3)
Coefficient Initialization Preset 2 c(-3)	121200	Measures the the coefficients for Preset 2 c(-3)
Coefficient Initialization Preset 2 c(-3)	201200	Measures the the coefficients for Preset 2 c(-3)
Coefficient Initialization Preset 2 c(0)	111203	Measures the the coefficients for Preset 2 c(0)
Coefficient Initialization Preset 2 c(0)	121203	Measures the the coefficients for Preset 2 c(0)
Coefficient Initialization Preset 2 c(0)	201203	Measures the the coefficients for Preset 2 c(0)
Coefficient Initialization Preset 2 c(1)	111204	Measures the the coefficients for Preset 2 c(1)
Coefficient Initialization Preset 2 c(1)	121204	Measures the the coefficients for Preset 2 c(1)
Coefficient Initialization Preset 2 c(1)	201204	Measures the the coefficients for Preset 2 c(1)
Coefficient Initialization Preset 3 c(-1)	111207	Measures the coefficients for Preset 3 c(-1)
Coefficient Initialization Preset 3 c(-1)	121207	Measures the coefficients for Preset 3 c(-1)
Coefficient Initialization Preset 3 c(-1)	201207	Measures the coefficients for Preset 3 c(-1)
Coefficient Initialization Preset 3 c(-2)	111206	Measures the coefficients for Preset 3 c(-2)
Coefficient Initialization Preset 3 c(-2)	121206	Measures the coefficients for Preset 3 c(-2)
Coefficient Initialization Preset 3 c(-2)	201206	Measures the coefficients for Preset 3 c(-2)
Coefficient Initialization Preset 3 c(-3)	111205	Measures the coefficients for Preset 3 c(-3)
Coefficient Initialization Preset 3 c(-3)	121205	Measures the coefficients for Preset 3 c(-3)
Coefficient Initialization Preset 3 c(-3)	201205	Measures the coefficients for Preset 3 c(-3)
Coefficient Initialization Preset 3 c(0)	111208	Measures the coefficients for Preset 3 c(0)
Coefficient Initialization Preset 3 c(0)	121208	Measures the coefficients for Preset 3 c(0)
Coefficient Initialization Preset 3 c(0)	201208	Measures the coefficients for Preset 3 c(0)
Coefficient Initialization Preset 3 c(1)	111209	Measures the coefficients for Preset 3 c(1)
Coefficient Initialization Preset 3 c(1)	121209	Measures the coefficients for Preset 3 c(1)
Coefficient Initialization Preset 3 c(1)	201209	Measures the coefficients for Preset 3 c(1)
Coefficient Initialization Preset 4 c(-1)	111212	Measures the coefficients for Preset 4 c(-1)
Coefficient Initialization Preset 4 c(-1)	121212	Measures the coefficients for Preset 4 c(-1)
Coefficient Initialization Preset 4 c(-1)	201212	Measures the coefficients for Preset 4 c(-1)
Coefficient Initialization Preset 4 c(-2)	111211	Measures the coefficients for Preset 4 c(-2)

Table 4 Test IDs and Names (continued)

Name	TestID	Description
Coefficient Initialization Preset 4 c(-2)	121211	Measures the coefficients for Preset 4 c(-2)
Coefficient Initialization Preset 4 c(-2)	201211	Measures the coefficients for Preset 4 c(-2)
Coefficient Initialization Preset 4 c(-3)	111210	Measures the coefficients for Preset 4 c(-3)
Coefficient Initialization Preset 4 c(-3)	121210	Measures the coefficients for Preset 4 c(-3)
Coefficient Initialization Preset 4 c(-3)	201210	Measures the coefficients for Preset 4 c(-3)
Coefficient Initialization Preset 4 c(0)	111213	Measures the coefficients for Preset 4 c(0)
Coefficient Initialization Preset 4 c(0)	121213	Measures the coefficients for Preset 4 c(0)
Coefficient Initialization Preset 4 c(0)	201213	Measures the coefficients for Preset 4 c(0)
Coefficient Initialization Preset 4 c(1)	111214	Measures the coefficients for Preset 4 c(1)
Coefficient Initialization Preset 4 c(1)	121214	Measures the coefficients for Preset 4 c(1)
Coefficient Initialization Preset 4 c(1)	201214	Measures the coefficients for Preset 4 c(1)
Coefficient Initialization Preset 5 c(-1)	111217	Measures the coefficients for Preset 5 c(-1)
Coefficient Initialization Preset 5 c(-1)	121217	Measures the coefficients for Preset 5 c(-1)
Coefficient Initialization Preset 5 c(-1)	201217	Measures the coefficients for Preset 5 c(-1)
Coefficient Initialization Preset 5 c(-2)	111216	Measures the coefficients for Preset 5 c(-2)
Coefficient Initialization Preset 5 c(-2)	121216	Measures the coefficients for Preset 5 c(-2)
Coefficient Initialization Preset 5 c(-2)	201216	Measures the coefficients for Preset 5 c(-2)
Coefficient Initialization Preset 5 c(-3)	111215	Measures the coefficients for Preset 5 c(-3)
Coefficient Initialization Preset 5 c(-3)	121215	Measures the coefficients for Preset 5 c(-3)
Coefficient Initialization Preset 5 c(-3)	201215	Measures the coefficients for Preset 5 c(-3)
Coefficient Initialization Preset 5 c(0)	111218	Measures the coefficients for Preset 5 c(0)
Coefficient Initialization Preset 5 c(0)	121218	Measures the coefficients for Preset 5 c(0)
Coefficient Initialization Preset 5 c(0)	201218	Measures the coefficients for Preset 5 c(0)
Coefficient Initialization Preset 5 c(1)	111219	Measures the coefficients for Preset 5 c(1)
Coefficient Initialization Preset 5 c(1)	121219	Measures the coefficients for Preset 5 c(1)
Coefficient Initialization Preset 5 c(1)	201219	Measures the coefficients for Preset 5 c(1)
Common-mode to Common-mode Output Return Loss	114000	Common-mode to Common-mode Output Return Loss measurement
Common-mode to Common-mode Output Return Loss	124000	Common-mode to Common-mode Output Return Loss measurement
Common-mode to Common-mode Output Return Loss	204000	Common-mode to Common-mode Output Return Loss measurement

Table 4 Test IDs and Names (continued)

Name	TestID	Description
Common-mode to Differential Output Return Loss	114001	Common-mode to Differential Output Return Loss measurement
Common-mode to Differential Output Return Loss	124001	Common-mode to Differential Output Return Loss measurement
Common-mode to Differential Output Return Loss	204001	Common-mode to Differential Output Return Loss measurement
DC Common Mode Output Voltage Test	203001	Test the DC common mode voltage. This test can only be tested in dual single ended connection
DC Common Mode Output Voltage Test	113003	Test the DC common mode voltage. This test can only be tested in dual single ended connection. Must be DC coupled.
DC Common Mode Voltage Test	123003	Test the DC common mode voltage. This test can only be tested in dual single ended connection. Must be DC coupled.
Differential Peak to Peak Output Voltage Test	203004	Test the maximum voltage with the TX enabled
Differential Peak to Peak Output Voltage Test with Output Disabled	123000	Test the maximum voltage with the Output disabled
Differential Peak to Peak Output Voltage Test with Output Enabled	123004	Test the maximum voltage with the Output enabled
Differential Peak to Peak Output Voltage Test with TX Disabled	113000	Test the maximum voltage with the TX disabled
Differential Peak to Peak Output Voltage Test with TX Enabled	113004	Test the maximum voltage with the TX enabled
Differential Peak to Peak Output Voltage Test with TX disabled	203000	Test the maximum voltage with the TX disabled
EOJ03	110101	Even-Odd Jitter 03 measurement
EOJ03	120101	Even-Odd Jitter 03 measurement
EOJ03	200101	Even-Odd Jitter 03 measurement
ERL	111004	Calculates ERL TP1a.
ERL	121004	Calculates ERL TP4.
ERL	201004	Calculates ERL.
Eye Height	115000	Measures the height of each the eye at user selected CTLE
Far-end Eye Height	125002	Measures the height of each the eye at user selected CTLE
Far-end Vertical Eye Closure	125003	Measures the Vertical Eye Closure TP4
J3u03	200102	J3u03 Jitter measurement
J4u03	110102	J4u03 Jitter measurement

Table 4 Test IDs and Names (continued)

Name	TestID	Description
J4u03	120102	J4u03 Jitter measurement
JRMS03	110100	JRMS03 measurement
JRMS03	120100	JRMS03 measurement
JRMS03	200100	JRMS03 measurement
Level - PRBS pattern	112000	Tests the level for each level in the PRBS pattern
Level - PRBS pattern	122000	Tests the level for each level in the PRBS pattern
Level - PRBS pattern	202000	Tests the level for each level in the PRBS pattern
Level RMS - PRBS pattern	112001	Tests the level rms for each level in the PRBS pattern
Level RMS - PRBS pattern	122001	Tests the level rms for each level in the PRBS pattern
Level RMS - PRBS pattern	202001	Tests the level rms for each level in the PRBS pattern
Level Separation Mismatch Ratio - RLM	112002	Tests the level mismatch ratio
Level Separation Mismatch Ratio - RLM	122002	Tests the level mismatch ratio
Level Separation Mismatch Ratio - RLM	202002	Tests the level mismatch ratio
Linear Fit Pulse Peak Ratio	111001	Linear Fit Pulse Peak Ratio
Linear Fit Pulse Peak Ratio	121001	Linear Fit Pulse Peak Ratio
Linear Fit Pulse Peak Ratio	201001	Linear Fit Pulse Peak Ratio
Near-end Eye Height	125000	Measures the height of each the eye at user selected CTLE
Near-end Vertical Eye Closure	125001	Measures the Vertical Eye Closure TP4
Signal-to-noise-and-distortion ratio	111002	Measures the SNDR
Signal-to-noise-and-distortion ratio	121002	Measures the SNDR
Signal-to-noise-and-distortion ratio	201002	Measures the SNDR
Signal-to-residual-intersymbol-interference ratio, SNRISI	111003	Measures the SNRISI
Signal-to-residual-intersymbol-interference ratio, SNRISI	121003	Measures the SNRISI
Signal-to-residual-intersymbol-interference ratio, SNRISI	201003	Measures the SNRISI
Signaling Rate	110000	Signaling rate of the signal
Signaling Rate	120000	Signaling rate of the signal
Signaling Rate	200000	Signaling rate of the signal
Steady-State Voltage Vf	111000	Steady-State Voltage Vf measurement
Steady-State Voltage Vf	121000	Steady-State Voltage Vf measurement

Table 4 Test IDs and Names (continued)

Name	TestID	Description
Steady-State Voltage Vf	201000	Steady-State Voltage Vf measurement
Vertical Eye Closure	115001	Measures the Vertical Eye Closure TP1a
abs Step Size for c(-1)	111102	abs Coefficient Step Size measurement for Coefficient c(-1)
abs Step Size for c(-1)	121102	abs Coefficient Step Size measurement for Coefficient c(-1)
abs Step Size for c(-1)	201102	abs Coefficient Step Size measurement for Coefficient c(-1)
abs Step Size for c(-2)	111101	abs Coefficient Step Size measurement for Coefficient c(-2)
abs Step Size for c(-2)	121101	abs Coefficient Step Size measurement for Coefficient c(-2)
abs Step Size for c(-2)	201101	abs Coefficient Step Size measurement for Coefficient c(-2)
abs Step Size for c(-3)	111100	abs Coefficient Step Size measurement for Coefficient c(-3)
abs Step Size for c(-3)	121100	abs Coefficient Step Size measurement for Coefficient c(-3)
abs Step Size for c(-3)	201100	abs Coefficient Step Size measurement for Coefficient c(-3)
abs Step Size for c(0)	111103	abs Coefficient Step Size measurement for Coefficient c(0)
abs Step Size for c(0)	121103	abs Coefficient Step Size measurement for Coefficient c(0)
abs Step Size for c(0)	201103	abs Coefficient Step Size measurement for Coefficient c(0)
abs Step Size for c(1)	111104	abs Coefficient Step Size measurement for Coefficient c(1)
abs Step Size for c(1)	121104	abs Coefficient Step Size measurement for Coefficient c(1)
abs Step Size for c(1)	201104	abs Coefficient Step Size measurement for Coefficient c(1)
value at min. state for c(-1)	111107	Measures the value of c(-1) at min
value at min. state for c(-1)	121107	Measures the value of c(-1) at min
value at min. state for c(-1)	201107	Measures the value of c(-1) at min
value at min. state for c(-2)	111106	Measures the value of c(-2) at min
value at min. state for c(-2)	121106	Measures the value of c(-2) at min
value at min. state for c(-2)	201106	Measures the value of c(-2) at min
value at min. state for c(-3)	111105	Measures the value of c(-3) at min
value at min. state for c(-3)	121105	Measures the value of c(-3) at min
value at min. state for c(-3)	201105	Measures the value of c(-3) at min
value at min. state for c(0)	111108	Measures the value of c(0) at min
value at min. state for c(0)	121108	Measures the value of c(0) at min
value at min. state for c(0)	201108	Measures the value of c(0) at min
value at min. state for c(1)	111109	Measures the value of c(1) at min

Table 4 Test IDs and Names (continued)

Name	TestID	Description
value at min. state for c(1)	121109	Measures the value of c(1) at min
value at min. state for c(1)	201109	Measures the value of c(1) at min

4 Instruments

The following table shows the instruments used by this application. The name is required by various remote interface methods.

- Instrument Name — The name to use as a parameter in remote interface commands.
- Description — The description of the instrument.

For example, if an application uses an oscilloscope and a pulse generator, then you would expect to see something like this in the table below:

Table 5 Example Instrument Information

Name	Description
scope	The primary oscilloscope.
Pulse	The pulse generator used for Gen 2 tests.

and you would be able to remotely control an instrument using:

```
ARSL syntax (replace [description] with actual parameter)
------------------------------------------------------------------------
arsl -a ipaddress -c "SendScpiCommandCustom 'Command=[scpi
command];Timeout=100;Instrument=pulsegen'"

arsl -a ipaddress -c "SendScpiQueryCustom 'Command=[scpi
query];Timeout=100;Instrument=pulsegen'"


C# syntax (replace [description] with actual parameter)
------------------------------------------------------------------------
SendScpiCommandOptions commandOptions = new SendScpiCommandOptions();
commandOptions.Command = "[scpi command]";
commandOptions.Instrument = "[instrument name]";
commandOptions.Timeout = [timeout];
remoteAte.SendScpiCommand(commandOptions);

SendScpiQueryOptions queryOptions = new SendScpiQueryOptions();
queryOptions.Query = "[scpi query]";
queryOptions.Instrument = "[instrument name]";
```

```
queryOptions.Timeout = [timeout];
remoteAte.SendScpiQuery(queryOptions);
```

Here are the actual instrument names used by this application:

NOTE The file, "InstrumentInfo.txt", which may be found in the same directory as this help file, contains all of the information found in the table below in a format suitable for parsing.

Table 6 Instrument Names

Instrument Name	Description
Infiniium	The primary oscilloscope
Keysight PNA	Performance Network Analyzer
Keysight ENA	Economy Network Analyzer

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