

Keysight D9050LDDC LPDDR5 Compliance Test Application

Notices

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In This Book

This book is your guide to programming the Keysight Technologies D9050LDDC LPDDR5 Compliance Test 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 21, **Chapter 4**, “Instruments,” starting on page 25, and **Chapter 5**, “Message IDs,” starting on page 27 provide information specific to programming the D9050LDDC LPDDR5 Compliance Test 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, 4, and 5 for changes.

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1 Introduction to Programming

Remote Programming Toolkit / 8

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

- Launching and closing the application.
- Configuring the options.
- Running tests.
- Getting results.
- Controlling when and where 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 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 D9050LDDC LPDDR5 Compliance Test Application uses Remote Interface Revision 6.30. 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 D9050LDDC LPDDR5 Compliance Test 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	Burst Clock Minimum Cycles	MinClockCycles	(Accepts user-defined text), 202	This option is used to specify the minimum number of cycles in burst signals for CK and WCK. Applicable to CK/WCK jitter timing tests.
Configure	First DQ Transition Search Range (ps)	FirstDQSearchRange	(Accepts user-defined text), 800	Specify the search range in picoseconds (ps) to look for the first DQ transition bit. This config ONLY affects tWCK2DQI and tWCK2DQO tests.
Configure	Max Acquisition Count	MaxAcqCount	(Accepts user-defined text), 5, 10, 20, 50	Determine the maximum number of acquisition that the app will used to try and achieved the required READ/WRITE measurement burst count(as specified in the "Multi Burst Count" option) when performing the tests. *Note: This option is applicable to all READ /WRITE burst related tests in the Electrical Tests group and Timing Tests group.

Table 2 Configuration Variables and Values (continued)

GUI Location	Label	Variable	Values	Description
Configure	Multi Burst Count	MultiBurstCount	(Accepts user-defined text), 1, 10, 100, 1000	Determine the number of READ/WRITE measurement burst(s) that is required when performing the tests. *Note: This option is applicable to all READ /WRITE burst related tests in the Electrical Tests group and Timing Tests group with the exception of VOH(AC), VOH(DC), VOL(AC), VOL(DC), VIHDiff(AC), VILDiff(AC), VOHDiff(AC) and VOLDiff(AC) tests.
Configure	Number of Clock Measurements	NumClockMeas	(Accepts user-defined text), 200	This value is used to set the number of total clock transitions to be measured - min 200.
Configure	Sampling Points (Pts) Electrical and Timing Tests Only	SamplingPoints	(Accepts user-defined text), 2000000, 1000000, 500000	Specifies the sampling points to be captured in all the tests except Eye Diagram tests. Reduce the sampling points if the read/write bursts are occurring very frequently.
Configure	Sampling Points (Pts) For Eye Diagram Tests Only	SamplingPointsEyeDiagram	(Accepts user-defined text), 2000000, 1000000, 500000, 250000, 100000	Specifies the sampling points to be captured in Eye Diagram tests. Reduce the sampling points if the read/write bursts are occurring very frequently. The 100000 sample points is recommended for the oscilloscope having Sampling rate between 20G/Sa to 40G/Sa because the slowness performance will happen in setting higher sample points. For the oscilloscope have higher sampling rate like 80G/Sa or above, user require to set the sample points to a higher value.

Table 2 Configuration Variables and Values (continued)

GUI Location	Label	Variable	Values	Description
Configure	Sampling Rate (GSa/s)	SamplingRate	MAX, 80, 40, 20, 10, 128, 64, 32, 16, 8	Specifies the sampling rate for the signal acquisition of all tests. If the selected sampling rate is higher than oscilloscope capability, application will set maximum sampling rate during runtime.
Configure	Total Waveform	EyeDiagramNumOfWave	(Accepts user-defined text), 500, 1000, 1500, 3000, 5000	Select or type the total number of waveforms with valid burst data to be processed for the eye diagram generated in the tTx_DQS2DQ test.
Configure	Window Width	WindowSize	(Accepts user-defined text), 200	Identifies the number of periods in the main sliding window.
Configure	tCIVW1 mask width (UI)	tCIVW1_option	(Accepts user-defined text), AUTO, 0.120, 0.140	Specify the tCIVW1 CA Rx mask width Values: 'AUTO' - uses the mask width defined in the spec. Or Numeric - Range from 0.01 to 1 to specify the mask width.
Configure	tCIVW2 mask width (UI)	tCIVW2_option	(Accepts user-defined text), AUTO, 0.120, 0.140	Specify the tCIVW2 CA Rx mask width Values: 'AUTO' - uses the mask width defined in the spec. Or Numeric - Range from 0.01 to 1 to specify the mask width.
Configure	tCSIVW1 mask width (UI)	tCSIVW1_option	(Accepts user-defined text), AUTO, 0.120, 0.140	Specify the tCSIVW1 CS Rx mask width Values: 'AUTO' - uses the mask width defined in the spec. Or Numeric - Range from 0.01 to 1 to specify the mask width.
Configure	tCSIVW2 mask width (UI)	tCSIVW2_option	(Accepts user-defined text), AUTO, 0.120, 0.140	Specify the tCSIVW2 CS Rx mask width Values: 'AUTO' - uses the mask width defined in the spec. Or Numeric - Range from 0.01 to 1 to specify the mask width.

Table 2 Configuration Variables and Values (continued)

GUI Location	Label	Variable	Values	Description
Configure	tDIVW1 mask width (UI)	tDIVW1_option	(Accepts user-defined text), AUTO, 0.120, 0.140	Specify the tDIVW1 DQ Rx mask width Values: 'AUTO' - uses the mask width defined in the spec. Or Numeric - Range from 0.01 to 1 to specify the mask width.
Configure	tDIVW2 mask width (UI)	tDIVW2_option	(Accepts user-defined text), AUTO, 0.120, 0.140	Specify the tDIVW2 DQ Rx mask width Values: 'AUTO' - uses the mask width defined in the spec. Or Numeric - Range from 0.01 to 1 to specify the mask width.
Configure	vCENT CA mode (V)	vCENTCA_option	(Accepts user-defined text), WidestOpening, 0.120, 0.140	Specify the vCENT CA vertical level mode. Where the vertical center of the mask will be placed. Values: 'WidestOpening' - uses the eye widest opening as the vCENT. Or Numeric - Positive values greater than 0 to specify the vCENT.
Configure	vCENT CS mode (V)	vCENTCS_option	(Accepts user-defined text), WidestOpening, 0.120, 0.140	Specify the vCENT CS vertical level mode. Where the vertical center of the mask will be placed. Values: 'WidestOpening' - uses the eye widest opening as the vCENT. Or Numeric - Positive values greater than 0 to specify the vCENT.
Configure	vCENT DQ mode (V)	vCENTDQ_option	(Accepts user-defined text), WidestOpening, 0.120, 0.140	Specify the vCENT DQ vertical level mode. Where the vertical center of the mask will be placed. Values: 'WidestOpening' - uses the eye widest opening as the vCENT. Or Numeric - Positive values greater than 0 to specify the vCENT.

Table 2 Configuration Variables and Values (continued)

GUI Location	Label	Variable	Values	Description
Configure	vCIVW mask height (V)	vCIVW_option	(Accepts user-defined text), AUTO, 0.120, 0.140	Specify the vCIVW CA Rx mask height Values: 'AUTO' - uses the mask height defined in the spec. Or Numeric - Positive values greater than 0 to specify the mask height.
Configure	vCSIVW mask height (V)	vCSIVW_option	(Accepts user-defined text), AUTO, 0.120, 0.140	Specify the vCSIVW CS Rx mask height Values: 'AUTO' - uses the mask height defined in the spec. Or Numeric - Positive values greater than 0 to specify the mask height.
Configure	vDIVW mask height (V)	vDIVW_option	(Accepts user-defined text), AUTO, 0.120, 0.140	Specify the vDIVW DQ Rx mask height Values: 'AUTO' - uses the mask height defined in the spec. Or Numeric - Positive values greater than 0 to specify the mask height.
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	App Test Mode	optAppTestMode	Live Signal, Offline	Set the application test mode. Available options include [Live Signal] or [Offline]
Set Up	Burst Identification Method	optBurstIDMethod	Rd or Wrt ONLY	Set Burst Identification Method
Set Up	CK (Diff) operation mode	optSignalSrcOpMode_CK_Diff	Burst, Continuous	Set the operation mode of the CK (Diff) source signal. Available options include [Burst] or [Continuous]
Set Up	CK_SE_HighV	InputThreshold_CLK_SE_High	(Accepts user-defined text), 0.7	CK_SE_HighV
Set Up	CK_SE_LowV	InputThreshold_CLK_SE_Low	(Accepts user-defined text), 0.5	CK_SE_LowV

Table 2 Configuration Variables and Values (continued)

GUI Location	Label	Variable	Values	Description
Set Up	DDR Data Rate - User Defined	optDDRDataRate	(Accepts user-defined text), 532, 1066, 1600, 2134, 2750, 3200, 3734, 4268, 4800, 5500, 6000, 6400	Set DDR Data Rate based on user defined values.
Set Up	Data source for CA live signal	optSignalSrc_Live_CA	Channel1, Channel2, Channel3, Channel4	Data source for CA live signal
Set Up	Data source for CA offline waveform	optSignalSrc_Offline_CA	(Accepts user-defined text)	Data source for CA offline waveform
Set Up	Data source for CA[x] live signal	optSignalSrc_Live_CA _x	Channel1, Channel2, Channel3, Channel4	Data source for CA[x] live signal
Set Up	Data source for CA[y] live signal	optSignalSrc_Live_CA _y	Channel1, Channel2, Channel3, Channel4	Data source for CA[y] live signal
Set Up	Data source for CK (Diff) live signal	optSignalSrc_Live_CK_Diff	Channel1, Channel2, Channel3, Channel4	Data source for CK (Diff) live signal
Set Up	Data source for CK (Diff) offline waveform	optSignalSrc_Offline_CK_Diff	(Accepts user-defined text)	Data source for CK (Diff) offline waveform
Set Up	Data source for CK_c live signal	optSignalSrc_Live_CK_c_SE	Channel1, Channel2, Channel3, Channel4	Data source for CK_c live signal
Set Up	Data source for CK_c offline waveform	optSignalSrc_Offline_CK_c_SE	(Accepts user-defined text)	Data source for CK_c offline waveform
Set Up	Data source for CK_t live signal	optSignalSrc_Live_CK_t_SE	Channel1, Channel2, Channel3, Channel4	Data source for CK_t live signal
Set Up	Data source for CK_t offline waveform	optSignalSrc_Offline_CK_t_SE	(Accepts user-defined text)	Data source for CK_t offline waveform
Set Up	Data source for CS live signal	optSignalSrc_Live_CS	Channel1, Channel2, Channel3, Channel4	Data source for CS live signal
Set Up	Data source for DQ live signal	optSignalSrc_Live_DQ	Channel1, Channel2, Channel3, Channel4	Data source for DQ live signal
Set Up	Data source for DQ offline waveform	optSignalSrc_Offline_DQ	(Accepts user-defined text)	Data source for DQ offline waveform

Table 2 Configuration Variables and Values (continued)

GUI Location	Label	Variable	Values	Description
Set Up	Data source for DQS (Diff) live signal	optSignalSrc_Live_RDQS_Diff	Channel1, Channel2, Channel3, Channel4	Data source for DQS (Diff) live signal
Set Up	Data source for RDQS (Diff) offline waveform	optSignalSrc_Offline_RDQS_Diff	(Accepts user-defined text)	Data source for RDQS (Diff) offline waveform
Set Up	Data source for WCK (Diff) live signal	optSignalSrc_Live_WCK_Diff	Channel1, Channel2, Channel3, Channel4	Data source for WCK (Diff) live signal
Set Up	Data source for WCK (Diff) offline waveform	optSignalSrc_Offline_WCK_Diff	(Accepts user-defined text)	Data source for WCK (Diff) offline waveform
Set Up	Expected Burst Data	optExpectedBurstDataType	ReadAndWrite, ReadOnly, WriteOnly	Set the expected burst data type available in test signal.
Set Up	InfiniiSim Threshold Mode	optThreshSetMode_ISim	Auto, Manual	InfiniiSim Threshold Mode
Set Up	LPDDR5 Signal Source	optDDRSignalSrc	CK (Diff), WCK (Diff), CK (Diff), WCK (Diff), CK (Diff), WCK (Diff), DQ, CK (Diff), WCK (Diff), DQ, CA, CK (Diff), WCK (Diff), DQ, RDQS (Diff), CK (Diff), CA[x], CA[y], CK (Diff), CA, CK (Diff), CS	Set LPDDR5 Signal Source.
Set Up	Lower Threshold [ISim] for CA	optLowerThres_InfiniiSim_CA	(Accepts user-defined text), 0.05	Lower Threshold [ISim] for CA
Set Up	Lower Threshold [ISim] for CK (Diff)	optLowerThres_InfiniiSim_CK_Diff	(Accepts user-defined text), -0.3, -0.2, -0.145	Lower Threshold [ISim] for CK (Diff)
Set Up	Lower Threshold [ISim] for CK_c (Single Ended)	optLowerThres_InfiniiSim_CK_c_SE	(Accepts user-defined text), 0.5	Lower Threshold [ISim] for CK_c (Single Ended)
Set Up	Lower Threshold [ISim] for CK_t (Single Ended)	optLowerThres_InfiniiSim_CK_t_SE	(Accepts user-defined text), 0.5	Lower Threshold [ISim] for CK_t (Single Ended)
Set Up	Lower Threshold [ISim] for CS	optLowerThres_InfiniiSim_CS	(Accepts user-defined text), 0.05	Lower Threshold [ISim] for CS
Set Up	Lower Threshold [ISim] for DQ	optLowerThres_InfiniiSim_DQ	(Accepts user-defined text), 0.05	Lower Threshold [ISim] for DQ

Table 2 Configuration Variables and Values (continued)

GUI Location	Label	Variable	Values	Description
Set Up	Lower Threshold [ISim] for RDQS (Diff)	optLowerThres_InfiniiSim_RDQS_Diff	(Accepts user-defined text), -0.3, -0.12, -0.15	Lower Threshold [ISim] for RDQS (Diff)
Set Up	Lower Threshold [ISim] for WCK (Diff)	optLowerThres_InfiniiSim_WCK_Diff	(Accepts user-defined text), -0.1, -0.12	Lower Threshold [ISim] for WCK (Diff)
Set Up	Lower Threshold for CA	optLowerThres_CA	(Accepts user-defined text), 0.05	Lower Threshold for CA
Set Up	Lower Threshold for CK (Diff)	optLowerThres_CK_Diff	(Accepts user-defined text), -0.3, -0.2, -0.145	Lower Threshold for CK (Diff)
Set Up	Lower Threshold for CK_c (Single Ended)	optLowerThres_CK_c_SE	(Accepts user-defined text), 0.5	Lower Threshold for CK_c (Single Ended)
Set Up	Lower Threshold for CK_t (Single Ended)	optLowerThres_CK_t_SE	(Accepts user-defined text), 0.5	Lower Threshold for CK_t (Single Ended)
Set Up	Lower Threshold for CS	optLowerThres_CS	(Accepts user-defined text), 0.05	Lower Threshold for CS
Set Up	Lower Threshold for DQ	optLowerThres_DQ	(Accepts user-defined text), 0.05	Lower Threshold for DQ
Set Up	Lower Threshold for RDQS (Diff)	optLowerThres_RDQS_Diff	(Accepts user-defined text), -0.3, -0.12, -0.15	Lower Threshold for RDQS (Diff)
Set Up	Lower Threshold for WCK (Diff)	optLowerThres_WCK_Diff	(Accepts user-defined text), -0.1, -0.12	Lower Threshold for WCK (Diff)
Set Up	Middle Threshold [ISim] for CA	optMiddleThres_InfiniiSim_CA	(Accepts user-defined text), 0.15	Middle Threshold [ISim] for CA
Set Up	Middle Threshold [ISim] for CK (Diff)	optMiddleThres_InfiniiSim_CK_Diff	(Accepts user-defined text), 0	Middle Threshold [ISim] for CK (Diff)
Set Up	Middle Threshold [ISim] for CK_c (Single Ended)	optMiddleThres_InfiniiSim_CK_c_SE	(Accepts user-defined text), 0.6	Middle Threshold [ISim] for CK_c (Single Ended)
Set Up	Middle Threshold [ISim] for CK_t (Single Ended)	optMiddleThres_InfiniiSim_CK_t_SE	(Accepts user-defined text), 0.6	Middle Threshold [ISim] for CK_t (Single Ended)
Set Up	Middle Threshold [ISim] for CS	optMiddleThres_InfiniiSim_CS	(Accepts user-defined text), 0.15	Middle Threshold [ISim] for CS

Table 2 Configuration Variables and Values (continued)

GUI Location	Label	Variable	Values	Description
Set Up	Middle Threshold [ISim] for DQ	optMiddleThres_InfiniiSim_DQ	(Accepts user-defined text), 0.15	Middle Threshold [ISim] for DQ
Set Up	Middle Threshold [ISim] for RDQS (Diff)	optMiddleThres_InfiniiSim_RDQS_Diff	(Accepts user-defined text), 0	Middle Threshold [ISim] for RDQS (Diff)
Set Up	Middle Threshold [ISim] for WCK (Diff)	optMiddleThres_InfiniiSim_WCK_Diff	(Accepts user-defined text), 0	Middle Threshold [ISim] for WCK (Diff)
Set Up	Middle Threshold for CA	optMiddleThres_CA	(Accepts user-defined text), 0.15	Middle Threshold for CA
Set Up	Middle Threshold for CK (Diff)	optMiddleThres_CK_Diff	(Accepts user-defined text), 0	Middle Threshold for CK (Diff)
Set Up	Middle Threshold for CK_c (Single Ended)	optMiddleThres_CK_c_SE	(Accepts user-defined text), 0.6	Middle Threshold for CK_c (Single Ended)
Set Up	Middle Threshold for CK_t (Single Ended)	optMiddleThres_CK_t_SE	(Accepts user-defined text), 0.6	Middle Threshold for CK_t (Single Ended)
Set Up	Middle Threshold for CS	optMiddleThres_CS	(Accepts user-defined text), 0.15	Middle Threshold for CS
Set Up	Middle Threshold for DQ	optMiddleThres_DQ	(Accepts user-defined text), 0.15	Middle Threshold for DQ
Set Up	Middle Threshold for RDQS (Diff)	optMiddleThres_RDQS_Diff	(Accepts user-defined text), 0	Middle Threshold for RDQS (Diff)
Set Up	Middle Threshold for WCK (Diff)	optMiddleThres_WCK_Diff	(Accepts user-defined text), 0	Middle Threshold for WCK (Diff)
Set Up	RDQS Postamble Length	optRDQS_Postamble_Length	2.5 tWCK, 4.5 tWCK	Set the length of Postamble for RDQS signal.
Set Up	RDQS Preamble Length	optRDQS_Preamble_Length	2 tWCK, 4 tWCK	Set the length of Preamble for RDQS signal.
Set Up	Upper Threshold [ISim] for CA	optUpperThres_InfiniiSim_CA	(Accepts user-defined text), 0.25	Upper Threshold [ISim] for CA
Set Up	Upper Threshold [ISim] for CK (Diff)	optUpperThres_InfiniiSim_CK_Diff	(Accepts user-defined text), 0.3, 0.2, 0.145	Upper Threshold [ISim] for CK (Diff)
Set Up	Upper Threshold [ISim] for CK_c (Single Ended)	optUpperThres_InfiniiSim_CK_c_SE	(Accepts user-defined text), 0.7	Upper Threshold [ISim] for CK_c (Single Ended)

Table 2 Configuration Variables and Values (continued)

GUI Location	Label	Variable	Values	Description
Set Up	Upper Threshold [ISim] for CK_t (Single Ended)	optUpperThres_InfiniiSim_CK_t_SE	(Accepts user-defined text), 0.7	Upper Threshold [ISim] for CK_t (Single Ended)
Set Up	Upper Threshold [ISim] for CS	optUpperThres_InfiniiSim_CS	(Accepts user-defined text), 0.25	Upper Threshold [ISim] for CS
Set Up	Upper Threshold [ISim] for DQ	optUpperThres_InfiniiSim_DQ	(Accepts user-defined text), 0.25	Upper Threshold [ISim] for DQ
Set Up	Upper Threshold [ISim] for RDQS (Diff)	optUpperThres_InfiniiSim_RDQS_Diff	(Accepts user-defined text), 0.3, 0.12, 0.15	Upper Threshold [ISim] for RDQS (Diff)
Set Up	Upper Threshold [ISim] for WCK (Diff)	optUpperThres_InfiniiSim_WCK_Diff	(Accepts user-defined text), 0.1, 0.12	Upper Threshold [ISim] for WCK (Diff)
Set Up	Upper Threshold for CA	optUpperThres_CA	(Accepts user-defined text), 0.25	Upper Threshold for CA
Set Up	Upper Threshold for CK (Diff)	optUpperThres_CK_Diff	(Accepts user-defined text), 0.3, 0.2, 0.145	Upper Threshold for CK (Diff)
Set Up	Upper Threshold for CK_c (Single Ended)	optUpperThres_CK_c_SE	(Accepts user-defined text), 0.7	Upper Threshold for CK_c (Single Ended)
Set Up	Upper Threshold for CK_t (Single Ended)	optUpperThres_CK_t_SE	(Accepts user-defined text), 0.7	Upper Threshold for CK_t (Single Ended)
Set Up	Upper Threshold for CS	optUpperThres_CS	(Accepts user-defined text), 0.25	Upper Threshold for CS
Set Up	Upper Threshold for DQ	optUpperThres_DQ	(Accepts user-defined text), 0.25	Upper Threshold for DQ
Set Up	Upper Threshold for RDQS (Diff)	optUpperThres_RDQS_Diff	(Accepts user-defined text), 0.3, 0.12, 0.15	Upper Threshold for RDQS (Diff)
Set Up	Upper Threshold for WCK (Diff)	optUpperThres_WCK_Diff	(Accepts user-defined text), 0.1, 0.12	Upper Threshold for WCK (Diff)
Set Up	User Comment	txtOverallUserComment	(Accepts user-defined text)	This option allow user to key in related test detail.
Set Up	VDD	InputVDD	(Accepts user-defined text), 1.1	VDD
Set Up	VDDQ	InputVDDQ	(Accepts user-defined text), 1.1	VDDQ

Table 2 Configuration Variables and Values (continued)

GUI Location	Label	Variable	Values	Description
Set Up	VIH_CA_AC	InputThreshold_Vih_ac_CA	(Accepts user-defined text), 0.25	VIH_CA_AC
Set Up	VIH_CS_AC	InputThreshold_Vih_ac_CS	(Accepts user-defined text), 0.25	VIH_CS_AC
Set Up	VIH_DQ	InputThreshold_Vih_ac_DQ	(Accepts user-defined text), 0.25	VIH_DQ
Set Up	VIHdiff_CK	VIHdiff_ac_CK	(Accepts user-defined text), 0.145	VIHdiff_CK
Set Up	VIHdiff_WCK	VIHdiff_WCK	(Accepts user-defined text), 0.12	VIHdiff_WCK
Set Up	VIL_CA_AC	InputThreshold_Vil_ac_CA	(Accepts user-defined text), 0.05	VIL_CA_AC
Set Up	VIL_CS_AC	InputThreshold_Vil_ac_CS	(Accepts user-defined text), 0.05	VIL_CS_AC
Set Up	VIL_DQ	InputThreshold_Vil_ac_DQ	(Accepts user-defined text), 0.05	VIL_DQ
Set Up	VILdiff_CK	VILdiff_ac_CK	(Accepts user-defined text), -0.145	VILdiff_CK
Set Up	VILdiff_WCK	VILdiff_WCK	(Accepts user-defined text), -0.12	VILdiff_WCK
Set Up	VOH_DQ_AC	InputThreshold_Voh_ac	(Accepts user-defined text), 0.25	VOH_DQ_AC
Set Up	VOHdiff_RDQS	optVOHdiff_RDQS	(Accepts user-defined text), 0.12, 0.15	VOHdiff_RDQS
Set Up	VOL_DQ_AC	InputThreshold_Vol_ac	(Accepts user-defined text), 0.05	VOL_DQ_AC
Set Up	VOLdiff_RDQS	optVOLdiff_RDQS	(Accepts user-defined text), -0.12, 0.15	VOLdiff_RDQS
Set Up	VrefCA	InputRefV_VrefCA	(Accepts user-defined text), 0.15	VrefCA
Set Up	VrefDQ	InputRefV_VrefDQ	(Accepts user-defined text), 0.15	VrefDQ
Set Up	WCK (Diff) operation mode	optSignalSrcOpMode_WCK_Diff	Burst, Continuous	Set the operation mode of the WCK (Diff) source signal. Available options include [Burst] or [Continuous]
Set Up	WCK to CK ratio	optWCK2CKRatio	2:1, 4:1	Set the WCK to CK ratio.

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:

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
SRldiffF_CK	151009	CK Differential Input Slew Rate for Clock Falling
SRldiffR_CK	151008	CK Differential Input Slew Rate for Clock Rising
VIHdiff_CK	151006	CK Differential Input High Voltage
VILdiff_CK	151007	CK Differential Input Low Voltage
Vindiff_CK	151000	CK Differential Input Voltage
Vindiff_CK/2HighPulse	151001	Half CK Differential Input Voltage for High Pulse
Vindiff_CK/2LowPulse	151002	Half CK Differential Input Voltage for Low Pulse
tCA2CA	142000	CA to CA offset
tCH(abs) Absolute HIGH Clock pulse width	102024	tCH(abs) Absolute HIGH Clock pulse width
tCH(avg) Average High pulse width	102022	tCH(avg) Average High pulse width
tCIPW	142004	CA Rx pulse width
tCIVW1 Margin	142001	CA Rx mask width margin
tCIVW2 Margin	142002	CA Rx mask width margin
tCK(abs) Absolute Clock period	102021	tCK(abs) Absolute Clock period
tCK(avg) Average Clock period	102020	tCK(avg) Average Clock period
tCL(abs) Absolute LOW Clock pulse width	102025	tCL(abs) Absolute LOW Clock pulse width
tCL(avg) Average Low pulse width	102023	tCL(avg) Average Low pulse width
tCSIPW	142023	CS Rx pulse width
tCSIVW1 Margin	142020	CS Rx mask width margin
tCSIVW2 Margin	142021	CS Rx mask width margin
tDIHL	141004	DQ Rx pulse width above/below vDIVW
tDIPW	141003	DQ Rx pulse width
tDIVW1 Margin	141000	DQ Rx mask width margin
tDIVW2 Margin	141001	DQ Rx mask width margin
tDQSQ	130002	RDQS-DQ skew
tQSH	130003	RDQS differential output high time

Table 4 Test IDs and Names (continued)

Name	TestID	Description
tQSL	130004	RDQS differential output low time
tQW	140000	Eye Diagram For Read Cycle
tRPRE	130000	Read preamble
tRPST	130001	Read postamble
tWCK(abs) Absolute Write Clock period	102001	tWCK(abs) Absolute Write Clock period
tWCK(avg) Average Write Clock period	102000	tWCK(avg) Average Write Clock period
tWCK2CK	131000	DQS latching transition to associated clock edge
tWCK2DQI_HF	141007	DQ to WCK input offset
tWCK2DQO_HF	140007	WCK to DQ output offset
tWCKH(abs) Absolute HIGH Write Clock pulse width	102004	tWCKH(abs) Absolute HIGH Write Clock pulse width
tWCKH(avg) Average High pulse width	102002	tWCKH(avg) Average High pulse width
tWCKL(abs) Absolute LOW Write Clock pulse width	102005	tWCKL(abs) Absolute LOW Write Clock pulse width
tWCKL(avg) Average Low pulse width	102003	tWCKL(avg) Average Low pulse width
tjit(CC) Maximum Clock Jitter between consecutive cycles	102026	tjit(CC) Maximum Clock Jitter between consecutive cycles
tjit(CC) Maximum Write Clock Jitter between consecutive cycles	102006	tjit(CC) Maximum Write Clock Jitter between consecutive cycles
tjit(per) Clock period jitter	102027	tjit(per) Clock period jitter
tjit(per) Write Clock period jitter	102007	tjit(per) Write Clock period jitter
vCIHL_AC	142005	CA Rx pulse amplitude
vCIVW Margin	142003	CA Rx mask height margin
vCSIHL_AC	142024	CS Rx pulse amplitude
vCSIVW Margin	142022	CS Rx mask height margin
vDIHL_AC	141005	DQ Rx pulse amplitude
vDIVW Margin	141002	DQ Rx mask height margin

3 Test Names and IDs

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.

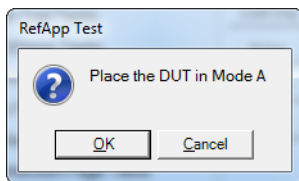
Table 6 Instrument Names

Instrument Name	Description
Infiniium	The primary oscilloscope

5 Message IDs

During the normal course of operation, an application displays multiple message prompts. The application's remote interface exposes a callback capability which enables remote clients to receive the text found in the prompt and to programmatically select the desired response (OK, Cancel, etc.). In order to determine which message is being received, the remote program could parse the message and look for key words. However, because message text is subject to change, a more reliable approach is to use the "message ID" that is attached to the more frequently-seen messages. The following table shows the IDs of the messages that this application may prompt during nominal operation.

For example, if the application may display the following prompt:



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

Message	ID	Responses	Usage
DUT mode message	313AEE2F-9EF0-476f-A2EB-29A5C7DE686F	OK=action completed and proceed, Cancel = abort test	App

- Message – A summary of the message in the prompt.
- ID – A unique code that will never change for this prompt, even if the message text changes (assuming the underlying purpose is maintained).
- Responses – The buttons on the prompt and their actions.
- Usage – The scope of the message:
 - "Common" – This message/ID may be used by other apps.

- "App" – This message/ID is unique to this app.
- "<testID>" – This message/ID is unique to this test ID.

A remote client would then structure the code in its message callback handler as shown below to manage message identification:

```
private static void OnSimpleMessage(object sender, MessageEventArgs e)
{
    if (e.ID == "313AEE2F-9EF0-476f-A2EB-29A5C7DE686F")
    {
        // Add code here to set the DUT in Mode A

        e.Response = DialogResult.OK;
    }
}
```

Here are actual message IDs used by this application:

NOTE

The file, "MessageInfo.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 7 Message IDs

Message	ID	Responses	Usage
Acq Limit: Can't determine minimum bandwidth	25A86458-151E-413D-B890-FC30CFD5ECAA	OK	Instrument
Activating limit will conflict with existing results	31A39751-6019-41de-89DF-59DB239DF978	OK=delete conflicting results, Cancel=cancel activation	Instrument
Already running tests	022467B0-6E08-40eb-B4D4-BBB018FBFBC7	OK	Instrument
App startup aborted	C2B67F67-E5D5-4845-8B63-443781223010	OK	Instrument
Can't set memory depth	FFFF1129-BD83-4318-993E-64C94033CEC4	OK=skip step and continue, Cancel=abort test	Instrument
Channel Setup: Unknown scope channel	CDE944EB-F440-4CB1-AFDC-7596461BCD86	OK	Instrument
Compliance/Debug mode change	9C72A970-8D7D-4b37-9787-48AEEA5DC3F1	OK=change mode, Cancel=abort action	Instrument
Confirmation Required	37437505-160C-4cc8-BA06-093C12994C1E	OK=continue, Cancel=abort test	Instrument
Connection change	879629E6-78FA-4a87-B247-A9DB4F0D7330	Abort=abort run, Retry=connection changed - continue run, Ignore=connection not changed - continue run	Instrument

Table 7 Message IDs (continued)

Message	ID	Responses	Usage
Debug pause (messages vary)	50B66A97-A6A9-413f-8329-76DFAC492FD6	OK=resume, Cancel=abort run	Instrument
End of run summary	602F9866-F975-42b7-842C-D8447E5E3FCB	OK	Instrument
End of run summary (test aborted)	124580E4-4486-42d4-B908-C6D0FB2AEE93	OK	Instrument
Error during CSV file generation	C88B1C64-8334-4b15-8727-81F5E2BA2ED4	OK	Instrument
Error during app exit	81112706-F720-4787-81D3-B22A9B692B41	OK	Instrument
Expected signal not found	86C74779-322E-4585-A07A-26A2C8FAAC84	Abort=abort test, Retry=retry failed action, Ignore=skip failed step	Instrument
Expected signal not found	7957D5B8-E62D-4224-A7DD-70361E816A43	Retry=retry failed action, Cancel=abort test	Instrument
InfiniiSim: Not available because scope default prevented	B8461A2C-9F5F-4AF3-94C1-DF77080D517A	OK	Instrument
InfiniiSim: Scope doesn't support settings found in project	C9BC2205-8041-448b-AF31-CF602183E989	OK	Instrument
InfiniiSim: Unknown scope channel	4E5ECAFA6-867C-47B3-982D-5F07E2090703	OK	Instrument
No test selected	B5D233AD-9EB4-4ac2-A443-A30A13643978	OK	Instrument
PrecisionProbe and InfiniiSim controllers turned off after config change	B4477006-D6D1-4375-9FF7-D8177FFC1BF9	OK	Instrument
PrecisionProbe/PrecisionCable: Not available because scope default prevented	6E60C9F8-8FBF-419C-B70A-B666FBDE3677	OK	Instrument
PrecisionProbe/PrecisionCable: Scope doesn't support settings found in project	2FC3B6FA-E28C-4700-9F46-4ABBA86A0D90	OK	Instrument
PrecisionProbe/PrecisionCable: Switch Controller is enabled	22F46DA8-89AE-4370-A57C-571DCF5BB87E	OK	Instrument
PrecisionProbe/PrecisionCable: Unknown scope channel	6788685B-9E88-47E6-BAE6-862F5BF3C9BA	OK	Instrument
Project loaded as read-only (reason)	98C785F8-D24F-4758-A18D-1CCE61F25371	OK	Instrument

Table 7 Message IDs (continued)

Message	ID	Responses	Usage
Project loaded with errors	58AD7A02-1E63-4d77-BC6C-6EF3E37AAD5B	OK	Instrument
Project not loaded	B2615E9C-5ED7-4db7-AEAF-2BC25C62B656	OK	Instrument
Project save failed (unauthorized access)	89DCC194-6254-4902-AE63-B7CCD12C8B2A	OK	Instrument
Run paused	FE2CF871-6D4A-4080-8FF9-770075590D9F	OK=resume, Cancel=abort run	Instrument
Setting change requires result deletion	8732A3AB-142C-47e5-86EA-DB737F415DDE	OK=delete results; Cancel=abort change	Instrument
Store mode change requires result deletion	884CDFDE-605E-4d04-B8FD-9B181E7FA468	OK=delete results, Cancel=abort change	Instrument
Switch Matrix controller turned off after config change	FC95EBAA-F33F-4eae-90BB-6A6A8F16E2DF	OK	Instrument
Switch Matrix: Auto mode unavailable after config change	6E5589DC-E073-4818-9E8A-782A75898475	OK	Instrument
Switch Matrix: Auto mode unavailable for model, all settings will be reset	F78BD2E2-BF29-42e0-98F8-23B6CE565B08	OK=go auto do reset, Cancel=abort action	Instrument
Switch Matrix: Confirm Auto mode	D5E1A12E-6218-4416-8451-5F9415D924BF	OK=go auto, Cancel=stay manual	Instrument
Switch Matrix: Obsolete items in settings discarded	0C45BD20-E0C2-481e-A3B6-9C1A26C2103A	OK	Instrument
Switch Matrix: Reconnect drivers	047FE44F-B251-49fa-B3C7-5590317230CD	Yes=use saved addresses, No=prompt for new addresses, Cancel=reset all settings	Instrument
Switch Matrix: Remove all InfiniiSim settings	C5560182-73BE-4901-941E-3DAEC9F07B33	OK=remove, Cancel=abort action	Instrument
Switch Matrix: User cancelled settings load	50F3FB70-AA6B-488e-8CFA-62CDA756F746	OK	Instrument
SwitchMatrix: Correction reset due to application route change	95FEA629-3BE1-4288-BA34-426516018B07	OK=Accept new routing, Cancel=Reset switch matrix settings	Instrument
SwitchMatrix: Instrument already connected to another driver	08556148-4D63-4edd-B894-22916F39849A	OK	Instrument
SwitchMatrix: Max num drivers exceeded	7D8994AB-FCC2-4294-87B3-19B972BB6510	OK	Instrument

Table 7 Message IDs (continued)

Message	ID	Responses	Usage
SwitchMatrix: Reset after drive reconnect fail	CF3E93B6-77FA-4FD7-B656-D286BE1C7C75	OK	Instrument
SwitchMatrix: Reset after drive reconnect fail	D298A4B8-F077-49BE-9CB2-AE6C14FB4705	OK	Instrument
SwitchMatrix: Unexpected multi-SPDT module	2723591D-55A9-44F3-9318-B732995D9427	OK	Instrument
SwitchMatrix: Unknown current switch state	ECE6535B-5C1A-4688-9E45-FB255435CC92	OK	Instrument
Unknown EEyeLocation parameter	FCA1C61B-D2EA-4671-AD48-9C080A6C6039	OK	Instrument
Upgrade app to open project	794C6148-ADF4-4b24-895D-74D94B76F8AE	OK	Instrument

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