Keysight D9021HDMC HDMI Compliance Test Application Release Notes

Keysight D9021HDMC HDMI Test Software Version 2.40.3006

Released Date:	6 Dec 2024
Requirements category:	
Operating System:	Windows 10 (64 bit), English, version 2004 or newer
Scope Software:	11.61.00002 (UXR-Series)
	06.74.01816 (Infiniium Z-Series, Infiniium V-Series)
Automation Controller(s):	4.19a (Allion Controller AJSC-1)
	1.2 (Allion Controller AJSC-1X)
	1.17 (Wilder Controller)
File Name:	SetupInfHDMIHEAC02403006.exe

*This D9021HDMI release was qualified with the listed software versions

Changes

- Upgraded Keysight License Service to 5.6.1.

- Upgraded the framework version to 7.41.3 and support layer to version 7.41.0.

- Modified margin calculation for HFR1-2 based on the 375mV window.

- Implemented a beta version of single-ended test HF1-1 Vicm according to gCTS.

- Added BitifEye switch matrix user guide documentation inside the HDMI application help folder.

- Removed the "Beta" for HF1-87 test as this test has been approved by 22-August-2024 and it is now located under the drop-down options of HDMI 2.1 TMDS Transmitter Tests.

Bug Fixes

- Fix incorrect display of Wilder Controller firmware version on the test report.

- Fix incorrect description for the VL measurement method under Configure Tab section.

- Fix incorrect display of description on the test report for FRL Save D3 and D0 lanes interpair waveform.

- Fix an automation issue while using the Wilder controller in certain condition where FRL NoFFE waveforms are saved when TxFFE0 waveforms are requested.

Known limitation

- HF1-87 test does not support connection with 2 probes - only 4 probes.

- Wilder controller automation is not compatible with HF1-87 yet.

- A small number of DUTs may not trigger on HF1-87. Improvements will be trialed at the next MOI Event.

- "Capture and analyze stored waveforms" mode may exhibit some minor instability resulting in tests being aborted including but not limited to HF1-87 execution. Should this issue be encountered, a workaround would be to run "Capture mode: Acquire and store waveforms" first followed by "Analyze mode: Analyze stored waveforms".

- Precision Probe calibration data in UXR-series scope may exhibit skew compensation instability, resulting in some FRL test failures. If this issue be encountered, please upgrade to Infiniium software version 11.61.00002 or later.

- Test Pass/Fail indicator icon may not display it correctly under the "Select Tests" tab when loading a saved project file. If this issue be encountered, please change the waveform capture mode to refresh the indicator icon.

Notes

- User must have valid D9020JITA and D9020ASIA licenses for D9021HDMC HDMI compliance test application.

Keysight D9021HDMC HDMI Test Software Version 2.40.2027

Released Date:	31 July 2024
Requirements category:	
Operating System:	Windows 10 (64 bit), English, version 2004 or newer
Scope Software:	11.52.00301 (UXR-Series)
	06.74.00701 (Infiniium Z-Series, Infiniium V-Series)
Automation Controller(s):	4.14b (Allion Controller AJSC-1)
	1.00 (Allion Controller AJSC-1X)
	1.25 (Wilder Controller)
File Name:	SetupInfHDMIHEAC02402027.exe

*This D9021HDMI release was qualified with the listed software versions

Changes

- Upgraded the framework and support layer to version 7.20.3.

- Enhanced waveform loading on the screen to prevent data out of range error.

- Extended the offline waveform folder dropdown menu to provide more visibility.

- Changed the default acquisition memory depth of HF1-87 test to 500M points.

- Removed HF1-87 test for D1 and D2 lanes as this test is only focus on D0 lane as per Keysight MOI v1c.

Bug Fixes

- Fix probe head enumeration issue when running FRL measurement.

- Fix exception error when saving or loading the switch matrix configuration settings.

- Fix missing of FRL FFE delta measurement test results when running with 3G and 6G 3 lanes configuration.

KEYSIGHT

- Fix incorrect display of single ended connection diagram for 2 probes with 1 data lane configuration.

Known limitation

- Wilder controller automation is not compatible with HF1-87 (Beta) yet.

- "Capture and analyze stored waveforms" mode may exhibit some minor instability resulting in tests being aborted including but not limited to HF1-87 execution. Should this issue be encountered, a workaround would be to run "Capture mode: Acquire and store waveforms" first followed by "Analyze mode: Analyze stored waveforms".

- Margin calculation for HFR1-2 may be inaccurate due to base reference number limitations. Manual calculation is suggested should margin calculation be needed, Vse+ margin = $(0.375V - (Vse\_max - Vtx\_cm))/0.375V$, Vse- margin = $(0.375V - (Vtx\_cm - Vse\_min))/0.375V$, where Vse_max is maximum single-ended voltage, Vse_min is minimum single-ended voltage and Vtx_cm is DC common mode voltage. Do note that Pass/Fail criteria is not affected.

Notes

- User should have valid D9020JITA and D9020ASIA licenses for proper operation of D9021HDMC HDMI compliance test application.

- This release fixes a probe head enumeration bug that affects version 2.40.2024 that could result in compensation variations. Tests affected are HFR1-1 and HFR1-2. Other tests and releases before version 2.40.2024 are not affected.

Keysight D9021HDMC HDMI Test Software Version 2.40.2024

Released Date:	26 April 2024
Requirements category:	
Operating System:	Windows 10 (64 bit), English, version 2004 or newer
Scope Software:	11.52.00001 (UXR-Series)
	06.74.00701 (Infiniium Z-Series, Infiniium V-Series)
Automation Controller(s):	4.14b (Allion Controller AJSC-1)
	1.00 (Allion Controller AJSC-1X)
	1.25 (Wilder Controller)
File Name:	SetupInfHDMIHEAC02402024.exe

*This D9021HDMI release was qualified with the listed software versions

Changes

- Upgraded to framework version 7.2.23.

- Renamed the probe selection of N28XXA to N280XA.

- Added automation support for Allion controller AJSC-1X.

- Enabled Switch Matrix capability for TMDS HF1-87 (Beta) test.

- Removed unsupported Keysight U3020A S26 switch from selection.

- Improved the exception handling in MATLAB pattern searching script.

- Improved the probe offset calibration warning message to cover both Port A and B.

KEYSIGHT

- Filtered the TMDS waveform capturing selection according to HDMI 1.4b and 2.1 video timing.

- Added display of stored test configuration details in test report when running with Analyze mode.

- Added adjustable time delay in between the TMDS VIC configuration set and start of test in debug mode.

- For HF1-87 (Beta), the assignment of cable model files is now being assigned automatically.

- Renamed the HF1-87 required worst cable model file from Cat1_WCM_v2.s4p to WorstCable1Model.s4p.

Bug Fixes

- Fix incorrect display oldest probe offset calibration date.

- Fix incorrect connection instruction for BitifEye BIT2100 switch matrix.

- Fix missing transfer function files when using TPA-R as the test fixture type.

- Fix incorrect display of measured FRL data rate value when capturing different LTP.

- Fix index error when running HF1-87 (Beta) test together with other HDMI 1.4b Single-ended test.

- Fix incorrect display of InfiniiSim correction mode selection at switch matrix settings when reload project file.

- Fix incorrect display of channel selection overlapped warning message for both 2 and 4 probes connection.

- Fix the app crash issue when launching the HDMI app with default waveform folder (Device1) being opened.

- Fix incorrect display of HF1-87 (Beta) test when using Analyze mode where no HF1-87 waveform was captured.

- Fix SICL error on HF1-8 when running both positive and negative skew test together using Capture and Analyze stored waveforms mode.

- Fix measurement error when switching from Transmitter Differential test to Single-Ended test when using 2 probes connection.

- Fix path configuration of BitifEye BIT2100 switch matrix for FRL Inter-pair skew test waveforms capturing on D3 and D0 lane.

Known limitation

- Wilder controller automation is not compatible with HF1-87 (Beta) yet.

- "Capture and analyze stored waveforms" mode may exhibit some minor instability resulting in tests being aborted including but not limited to HF1-87 execution. Should this issue be encountered, a workaround would be to run "Capture mode: Acquire and store waveforms" first followed by "Analyze mode: Analyze stored waveforms".

- Margin calculation for HFR1-2 may be inaccurate due to base reference number limitations. Manual calculation is suggested should margin calculation be needed, Vse+ margin = $(0.375V - (Vse\_max - Vtx\_cm))/0.375V$, Vse- margin = $(0.375V - (Vtx\_cm - Vse\_min))/0.375V$, where Vse_max is maximum single-ended voltage, Vse_min is minimum single-ended voltage and Vtx_cm is DC common mode voltage. Do note that Pass/Fail criteria is not affected.

Keysight D9021HDMC HDMI Test Software Version 2.40.2019

Released Date:	18 October 2023
Requirements category:	
Operating System:	Windows 10 (64 bit), English, version 2004 or newer
Scope Software:	11.50.00402 (UXR-Series)
	06.74.00402 (Infiniium Z-Series, Infiniium V-Series)
Automation Controller(s):	4.08d (Allion Controller)
	1.25 (Wilder Controller)
File Name:	SetupInfHDMIHEAC02402019.exe

*This D9021HDMI release was qualified with the listed software versions

Changes

- Upgraded to framework version 7.2.20 and support layer version 7.3.0.

- Default configure setting of Check Measured TMDS character rate set to true.

- Implemented single-ended test HF1-87 (Beta) according to gCTS and added related new cable model files.

- Implemented new user config variable (VsyncAcqPoint) for HF1-87 (Beta) memory depth setting.

- Removed the "live" word for FRL standard mode description as the analyze part is done on saved waveform.

- Modified the Wilder controller command to use FRL_Start_Flag_Clear instead of FRL_Start_Set to cover more DUTs.

- Stop sending the "frl_start 1" command during FRL test with Allion controller to prevent automation disruption.

- Increased the HPD pulse width from 1 second to 3 seconds when using Allion controller to cover more DUTs.

- Added automation controller version to final test report for tracking purpose.

Bug Fixes

- Fix incorrect display of MX0023A probe offset calibration diagram.

- Fix incorrect display of saved data rate selection for project reload.

- Fix missing TMDS description content when switch from Standard to Analyze mode.

- Fix incorrect display of 2 probes clock lane connection diagram for HF1-1 and HF1-4.

Known limitation

- For HF1-87 (Beta), the assignment of cable model files will need to be done manually from the interface as it is not automated yet.

- Wilder controller automation is not compatible with HF1-87 (Beta) yet.

- "Capture and analyze stored waveforms" mode may exhibit some minor instability resulting in tests being aborted including but not limited to HF1-87 execution. Should this issue be encountered, a workaround would be to run "Capture mode: Acquire and store waveforms" first followed by "Analyze mode: Analyze stored waveforms".

Notes

- Support for the Keysight U3020AS26 switch is on as as-is best effort basis.

Keysight D9021HDMC HDMI Test Software Version 2.40.2010

Released Date:	15 April 2023
Requirements category:	
Operating System:	Windows 10 (64 bit), English, version 2004 or newer
Scope Software:	11.40.00401 (UXR-Series)
	06.73.00301 (Infiniium Z-Series, Infiniium V-Series)
Automation Controller(s):	4.08d (Allion Controller)
	1.25 (Wilder Controller)
File Name:	SetupInfHDMIHEAC02402010.exe

*This D9021HDMI release was qualified with the listed software versions

Changes

- Updated to version gCTS 2.1f for HFR1-9 to automate coverage for clauses 3.7.3.1 and 3.7.2.3.

- Added new probe selections of MX0021/22/24/25 for TMDS and MX0024/25 for FRL testing.

- Probes selection for N5380X/1169X and MX0105A/MX0023A listed as not recommended for new designs.

Bug Fixes

- Fix incorrect display of HDMIAutomationDriver on test report when automation controller is disabled.

- Fix potentially wrong value from unrefreshed data of FRL inter-pair skew result when switch matrix is used.

- Fix potentially wrong value from unrefreshed setting when switching from single-ended measurement HF1-1 to differential measurement HF1-7.

- Fix missing selection of FRL No FFE0 waveform capturing with FFE test method 2.

Keysight D9021HDMC HDMI Test Software Version 2.40.1007

Released Date:	17 October 2022
Requirements category:	
Operating System:	Windows 10 (64 bit), English, version 2004 or newer
Scope Software:	11.25.00202 (UXR-Series)
	06.72.00302 (Infiniium Z-Series, Infiniium V-Series)
Automation Controller(s):	4.08d (Allion Controller)
	1.25 (Wilder Controller)
File Name:	SetupInfHDMIHEAC02401007.exe

*This D9021HDMI release was qualified with the listed software versions

Changes

-   Updated HFR1-9 tests to meet new MOI requirement.

-   Automation controller type added to final report If present.

-   Extended TMDS VIC support for automation controllers

Bug Fixes

-   Fix for potential crash when reloading projects with automation controllers connected.

-   Fix for FRL Inter-pair testing with Wilder controller.

-   Fix for incorrectly displayed D0 Preshoot FFE1 value in FRL HFR1-9 tests.

Keysight D9021HDMC HDMI Test Software Version 2.40.0013

Released Date:	18 May 2022
Requirements category:	
Operating System	Microsoft Windows 7 or higher
Requirements category (e.g., minimum instrument software version):	11.25.00202 (UXR-Series) 06.71.00202 (Infiniium Z-Series, Infiniium V-Series)
File Name:	SetupInfHDMIHEAC0240013.exe

Changes

- Minor update to clean-up UI strings

Keysight D9021HDMC HDMI Test Software Version 2.40.0011

Released Date:	16 March 2022
Requirements category:	
Operating System	Microsoft Windows 7 or higher
Requirements category (e.g., minimum instrument software version):	11.25.00202 (UXR-Series) 06.71.00202 (Infiniium Z-Series, Infiniium V-Series)
File Name:	SetupInfHDMIHEAC0240011.exe

Changes

- Wilder controller support for TMDS and FRL FFE (BETA)

- Added debug option to run all selected data rates in FRL

- Existing FRL test results will be reset when changing FFE Method

- Prevent Device Name/Connection Setup changes in Analysis Mode

Bug Fixes

- Fix for missing TMDS eye diagram in Standard mode

- Fix for missing TMDS status dots in Capture mode

- Fix for TMDS VIC retention when switching modes

- Fix for HFR5-1-9 result display

- Fix for incorrect waveform selected on project load

Known Issues

- While using the Wilder controller in FRL Capture mode, the inter-pair skew capture may generate an error when run individually. This may be worked around by selecting another data-lane to capture along with the inter-pair skew.

- When using the Wilder controller, reloading a project multiple times with the controller connected may cause a crash. Restarting the HDMI application before loading the project will work around the issue.

Keysight D9021HDMC HDMI Test Software Version 2.39.3001

Released Date:	1 October 2021
Requirements category:	
Operating System	Microsoft Windows 7 or higher
Requirements category (e.g., minimum instrument software version):	11.15.00203 (UXR-Series) 06.70.00001 (Infiniium Z-Series, Infiniium V-Series)
File Name:	SetupInfHDMIHEAC02393001.exe

Changes

- Diff Pair mode on Cable test use A-B as offset value

- Set probe offset to zero if cable test is detected

- Allow all FRL data rates to be run simultaneously if enabled in debug mode

- Reset tests when changing between FFE methods, add FFE method type to test report

- Default inter-pair skew bit length set to 14 bits

Bug fixes

- Prevent invalid VIC that was loaded from default template together with saved project settings from being executed

- Fix misplaced inter-pair skew markers

- Fix probe state reset after calibration

Keysight D9021HDMC HDMI Test Software Version 2.39.1001

Released Date:	29 June 2021
Requirements category:	
Operating System	Microsoft Windows 7 or higher
Requirements category (e.g., minimum instrument software version):	11.15.00001 (UXR-Series) 06.60.00601 (Infiniium Z-Series, Infiniium V-Series)
File Name:	SetupInfHDMIHEAC02391001.exe

Changes

- Improved TMDS analysis performance for UXR-Series scopes

- Updated description for HDMIWaveformDataRate and HDMIWaveformPattern to match actual functionality

- Update TMDS pixel clock value based on bitdepth and colorspace

Bug fixes

- Fix for FRL method setting not loading correctly after recall

- Fix for switch matrix settings not matching disabled state

- Fix for incorrect probe check for eARC

Keysight D9021HDMC HDMI Test Software Version 2.38.0005

Released Date:	22 April 2021
Requirements category:	
Operating System	Microsoft Windows 7 or higher
Requirements category (e.g., minimum instrument software version):	10.25.01202 (UXR-Series) 06.60.00109 (Infiniium Z-Series, Infiniium V-Series)
File Name:	SetupInfHDMIHEAC02380005.exe

Changes

- Added support for Wilder controller (BETA)

- Added support for 'mkedid' command with Allion controller

Bug fixes

- Fix for error performing TMDS tests with SkipEyeTests set to true

- Fix for TMDS cable test issue with N7010 probe

- Fix for HF1-7/HF1-8 not displaying only the highest data rate result

- Updated incorrect test description for FRL eye mask tests

Keysight D9021HDMC HDMI Test Software Version 2.37.0009

Released Date:	22 April 2021
Requirements category:	
Operating System	Microsoft Windows 7 or higher
Requirements category (e.g., minimum instrument software version):	10.25.01202 (UXR-Series) 06.60.00109 (Infiniium Z-Series, Infiniium V-Series)
File Name:	SetupInfHDMIHEAC02370009.exe

NOTE: This release is for ARC/eARC testing only

Changes

- Added support for E2678A/B, N5449A probes

Bug fixes

- Fixes for HEAC/ARC issues

- Fix for missing V scaling when measurement waveform is off screen

Keysight D9021HDMC HDMI Test Software Version 2.36.002

Released Date:	8 October 2020
Requirements category:	
Operating System	Microsoft Windows 7 or higher
Requirements category (e.g., minimum instrument software version):	10.25.00902 (UXR-Series) 06.55.00902 (Infiniium Z-Series, Infiniium V-Series)
File Name:	SetupInfHDMIHEAC0236.exe

Changes

- Added support for MX0105A probe.

- Updated HFR1-9 monotonicity tests to be PASS/FAIL results rather than informational only.

- Added 24 new tests for HFR1-9 FFE monotonicity FFE deltas.

- Added new configuration option to allow for selection between FRL Tx and Cable thresholds for inter-pair skew tests.

- Updated HFR tests to comply with GCTS 2.1c bit-rate selection requirements.

- Prevented unsupported scope models from running the software

Bug fixes

- Fixed probe type selection not sticking when exiting Device Configuration menu.

- Fixed invalid histogram generation with Infiniium version 6.50.01104.

- Fixed flipped waveforms in D0/D1 inter-skew measurements.

Keysight D9021HDMC HDMI Test Software Version 2.35

Released Date:	25 March 2020
Requirements category:	
Operating System	Microsoft Windows 7 or higher
Requirements category (e.g., minimum instrument software version):	10.12.05302 (UXR-Series)
	06.50.01104 (Infiniium Z-Series, Infiniium V-Series)
File Name:	SetupInfHDMIHEAC0235.exe

Changes

- Upgraded to framework version FW0610 and support layer version SL0610 to address license issue in which HDMI licenses are not recognized by baseline.

- Added following new config variables to allow user to delay FFE change states with DUT automation:

    o   Wait time to change FFE Level

    o   Wait time to change FFE Type

- Added following FRL test fixtures to support AOC test:

    o   Wilder HDMI2.1 TPA-R

    o   BIT-1010-0400-0 HDMI 2.1 TPA-R

    o   Luxshare TPA-R

Keysight D9021HDMC HDMI Test Software Version 2.34

Released Date:	20 December 2019
Requirements category:	
Operating System	Microsoft Windows 7 or higher
Requirements category (e.g., minimum instrument software version):	10.11.05004 (UXR-Series) 06.50.00818 (Infiniium Z-Series, Infiniium V-Series)
File Name:	SetupInfHDMIHEAC0234.exe

Changes

- FRL waveform capture tests have been broken down to individual lanes as follows:

  o Save Lane D3 Waveform (TP1) (LTP8)
  o Save Lane D3 Waveform (TP1) (LTP8) (All lanes transmit)
  o Save Lane D3 Waveform (TP1) (LTP8) (All lanes transmit)
  o Save Lane D3 Waveform (TP1) (LTP4)
  o Save Lane D0 Waveform (TP1) (LTP5)
  o Save Lane D0 Waveform (TP1) (LTP5) (All lanes transmit)
  o Save Lane D0 Waveform (TP1) (LTP3)
  o Save Lane D0 Waveform (TP1) (LTP4)
  o Save Lane D1 Waveform (TP1) (LTP6)
  o Save Lane D1 Waveform (TP1) (LTP6) (All lanes transmit)
  o Save Lane D1 Waveform (TP1) (LTP3)
  o Save Lane D1 Waveform (TP1) (LTP4)
  o Save Lane D2 Waveform (TP1) (LTP7)
  o Save Lane D2 Waveform (TP1) (LTP7) (All lanes transmit)
  o Save Lane D2 Waveform (TP1) (LTP3)
  o Save Lane D2 Waveform (TP1) (LTP4)
  o Save Lane D3 Normal FFE0 Waveforms (TP1) (LTP4)
  o Save Lane D0 Normal FFE0 Waveforms (TP1) (LTP4)
  o Save Lane D3 De-emphasis FFE0 Waveforms (TP1) (LTP4)
  o Save Lane D0 De-emphasis FFE0 Waveforms (TP1) (LTP4)
  o Save Lane D3 Pre-shoot FFE0 Waveforms (TP1) (LTP4)
  o Save Lane D0 Pre-shoot FFE0 Waveforms (TP1) (LTP4)
  o Save Lane D1 normal FFE0 Waveforms (TP1) (LTP4)
  o Save Lane D2 normal FFE0 Waveforms (TP1) (LTP4)
  o Save Lane D1 De-emphasis FFE0 Waveforms (TP1) (LTP4)
  o Save Lane D2 De-emphasis FFE0 Waveforms (TP1) (LTP4)

- o   Save Lane D1 Pre-shoot FFE0 Waveforms (TP1) (LTP4)
- o   Save Lane D2 Pre-shoot FFE0 Waveforms (TP1) (LTP4)
- o   Save Lane D3 Normal FFE1 Waveforms (TP1) (LTP4)
- o   Save Lane D0 Normal FFE1 Waveforms (TP1) (LTP4)
- o   Save Lane D3 De-emphasis FFE1 Waveforms (TP1) (LTP4)
- o   Save Lane D0 De-emphasis FFE1 Waveforms (TP1) (LTP4)
- o   Save Lane D3 Pre-shoot FFE1 Waveforms (TP1) (LTP4)
- o   Save Lane D0 Pre-shoot FFE1 Waveforms (TP1) (LTP4)
- o   Save Lane D1 De-emphasis FFE1 Waveforms (TP1) (LTP4)
- o   Save Lane D2 De-emphasis FFE1 Waveforms (TP1) (LTP4)
- o   Save Lane D1 Pre-shoot FFE1 Waveforms (TP1) (LTP4)
- o   Save Lane D2 Pre-shoot FFE1 Waveforms (TP1) (LTP4)
- o   Save Lane D3 Normal FFE2 Waveforms (TP1) (LTP4)
- o   Save Lane D0 Normal FFE2 Waveforms (TP1) (LTP4)
- o   Save Lane D3 De-emphasis FFE2 Waveforms (TP1) (LTP4)
- o   Save Lane D0 De-emphasis FFE2 Waveforms (TP1) (LTP4)
- o   Save Lane D3 Pre-shoot FFE2 Waveforms (TP1) (LTP4)
- o   Save Lane D0 Pre-shoot FFE2 Waveforms (TP1) (LTP4)
- o   Save Lane D1 normal FFE2 Waveforms (TP1) (LTP4)
- o   Save Lane D2 normal FFE2 Waveforms (TP1) (LTP4)
- o   Save Lane D1 De-emphasis FFE2 Waveforms (TP1) (LTP4)
- o   Save Lane D2 De-emphasis FFE2 Waveforms (TP1) (LTP4)
- o   Save Lane D1 Pre-shoot FFE2 Waveforms (TP1) (LTP4)
- o   Save Lane D2 Pre-shoot FFE2 Waveforms (TP1) (LTP4)
- o   Save Lane D3 Normal FFE3 Waveforms (TP1) (LTP4)
- o   Save Lane D0 Normal FFE3 Waveforms (TP1) (LTP4)
- o   Save Lane D3 De-emphasis FFE3 Waveforms (TP1) (LTP4)
- o   Save Lane D0 De-emphasis FFE3 Waveforms (TP1) (LTP4)
- o   Save Lane D3 Pre-shoot FFE3 Waveforms (TP1) (LTP4)
- o   Save Lane D0 Pre-shoot FFE3 Waveforms (TP1) (LTP4)
- o   Save Lane D1 normal FFE3 Waveforms (TP1) (LTP4)
- o   Save Lane D2 normal FFE3 Waveforms (TP1) (LTP4)
- o   Save Lane D1 De-emphasis FFE3 Waveforms (TP1) (LTP4)
- o   Save Lane D2 De-emphasis FFE3 Waveforms (TP1) (LTP4)
- o   Save Lane D1 Pre-shoot FFE3 Waveforms (TP1) (LTP4)
- o   Save Lane D2 Pre-shoot FFE3 Waveforms (TP1) (LTP4)

- FRL rise/fall time measurements are now replaced with rise/fall slew rate measurements.

- FRL eye mask will be expanded vertically using measured RJ value.

Keysight D9021HDMC HDMI Test Software Version 2.33

Released Date:	7 June 2019
Requirements category:	
Operating System	Microsoft Windows 7 or higher
Requirements category (e.g., minimum instrument software version):	10.10.04512 (UXR-Series) 06.40.00714 (Infiniium Z-Series, Infiniium V-Series)
File Name:	SetupInfHDMIHEAC0233.exe

Changes

- Compliance application has been renamed from N5399E/F HDMI Test to D9021HDMC HDMI Test.

- Added support for PPKS license scheme.

- Added support for Allion EDID Controller Timing Control Automation for FRL Physical Layer test type.

- Added Save Lane D3 and D0 Waveform (TP1) (LTP8/5) (All lanes transmit) for FRL Physical Layer test type.

- Added Save Lane D1 and D2 Waveform (TP1) (LTP6/7) (All lanes transmit) for FRL Physical Layer test type.

Bug fixes

- When using switch matrix, variables was incorrectly reset. Fixed the issue. Tests now works fine with switch matrix.

Known Issues

- For FRL Physical Layer test, user will need to select only 1 data rate at a time when capturing waveform. The application will not be able to handle multiple data rates selection for now.

- HDMI Test Compliance Application Online Help installed is not the latest version. Please download the latest version from Keysight website.

Keysight N5399E/N5399F HDMI Test Software Version 2.32

Released Date:	30 November 2018
Requirements category:	
Operating System	Microsoft Windows 7 or higher
Requirements category (e.g., minimum instrument software version):	10.00.03708 (UXR-Series) 06.XX.XXXX (Infiniium Z-Series, Infiniium V-Series)
File Name:	SetupInfHDMIHEAC0232.exe

Changes

- Removed HDMI_Compliance_Testing.pdf method of implementation document.

Bug fixes

- Handle offset errors for single-ended measurements when using N700XA probe amplifiers.

- Handle mask offset error when using N700XA probe amplifier in differential (A–B) mode.

Keysight N5399E/N5399F HDMI Test Software Version 2.31

Released Date:	10 October 2018
Requirements category:	
Operating System	Microsoft Windows 7 or higher
Requirements category (e.g., minimum instrument software version):	10.00.03708 (UXR-Series) 06.XX.XXXX (Infiniium Z-Series, Infiniium V-Series)
File Name:	SetupInfHDMIHEAC0231.exe

New Features

- Supports Infiniium Oscilloscope Software version 10.00 for UXR-Series oscilloscope.

Enhancements

- Added back Timing Control Automation support via QD980.

- Added Timing Control Automation support for Allion SCDC controller.

Known Issue

- User will experience the increase in the test time when running the TP2 measurements in UXR-Series oscilloscope.

Keysight N5399E/N5399F HDMI Test Software Version 2.30

Released Date:	3 August 2018
Requirements category:	
Operating System	Microsoft Windows 7 or higher
Infiniium software version	6.20.00902 (90000 Series, 90000 X-Series, 90000 Q-Series, Z-Series, V-Series)
File Name:	SetupInfHDMIHEAC0230.exe

Enhancements

- Migrated to Framework version 5.90.

- Added Fixed Linked Rate tests. Selectable under HDMI Test Type as "FRL Physical Layer".

- Added eARC tests (accessible only through BitiFeye's ValiFrame software or in Offline mode to postprocess acquired waveforms).

- Added port B probe offset calibration when detected N700xA probes.

- Removed Timing Control Automation support via PC LAN and QD980.

Modifications

- HDMI 1.4b/2.0 test selections is renamed to TMDS Physical Layer Test under HDMI Test Type.

Keysight D9021HDMC HDMI Compliance Test Application Release Notes

Keysight N5399C/N5399D HDMI Test Software Version 2.21

Released Date:	29 August 2017
Requirements category:	
Operating System	Microsoft Windows 7
Infiniium software version	6.00.00623 (90000 Series, 90000 X-Series, 90000 Q-Series, Z-Series, V-Series)
File Name:	SetupInfHDMIHEAC0221.exe

Enhancements

- Added support for N700X probes.

- Intra-pair skew measurements (7-7 and HF1-4) will use the mean instead of mode value of the histogram for pass/fail comparison.

Keysight N5399C/N5399D HDMI Test Software Version 2.20

Released Date:	29 March 2017
Requirements category:	
Operating System	Microsoft Windows 7
Infiniium software version	6.00.00537 (90000 Series, 90000 X-Series, 90000 Q-Series, Z-Series, V-Series)
File Name:	SetupInfHDMIHEAC0220.exe

Enhancements

- Added a few new test modes:

  o Capture mode: Acquire and store waveforms only

  o Analyze mode: Analyze captured waveforms

  o Capture and analyze stored waveforms

- Add support for Infiniium Oscilloscope Software version 6.0.

- Improved HDMI probe offset calibration to store offset values by channel/model/serial number instead of just by channel. This way calibrating new probes will not overwrite existing values of other probes.

- All MATLAB scripts are now compiled with MATLAB R2016B. MATLAB runtime version 9.1 will be required and will be checked during installation.

Keysight N5399C/N5399D HDMI Test Software Version 2.14

Released Date:	18 October 2016
Requirements category:	
Operating System	Microsoft Windows 7
Infiniium software version	5.70.00713 (90000 Series, 90000 X-Series, 90000 Q-Series, Z-Series, V-Series)
File Name:	SetupInfHDMIHEAC0214.exe

Enhancements

- Added support for GBit Serial Trigger mode for HF1-3: Inter-Pair Skew tests. This only applies to DSOV 90000 series scope that has N2119AU hardware serial trigger accessory card installed.

- Added 4 probes/1 lane configuration support for cable and receiver tests.

- Added 2 more fixture selection under Channel embed/de-embedding setup GUI to support the new s-parameters for 6-inch and 12-inch Wilder HDMI2 TPA-P fixtures.

- Improved algorithm to determine accurate calibration offset to use based on measured channel offset.

Bug Fixes

- Fixed data eye test issue where when there is an eye violation the mask movement will be very slow on second trial onwards.

Keysight N5399C/N5399D HDMI Test Software Version 2.13

Released Date:	
Requirements category:	
Operating System	Microsoft Windows 7
Infiniium software version	4.60 (90000 Series, 90000 X-Series, 90000 Q-Series, Z-Series)
File Name:	SetupInfHDMIHEAC0213.exe

Enhancements

- This version runs on 64-bit Windows 7 only therefore will no longer support oscilloscopes with Windows XP OS.

- Added support for Infiniium Oscilloscope Software version 5.60.

- Removed 2 probes/ lane option and 4 probes/3 lanes configuration for HF1-8: DX Mask Test (TP2_EQ with Worst Case Positive/Negative Skew) to comply with CTS requirement. User will need to use 4 probes/1 lane configuration to run this tests.

Keysight N5399C/N5399D HDMI Test Software Version 2.12.0001

Released Date:	
Requirements category:	
Operating System	Microsoft Windows 7
Infiniium software version	4.60 (90000 Series, 90000 X-Series, 90000 Q-Series, Z-Series)
File Name:	SetupInfHDMIHEAC02120001.exe

Enhancements

- Improved time out performance.

- Added time out config in Configure tab so that users may set appropriate time out to use.

Keysight N5399C/N5399D HDMI Test Software Version 2.12

Released Date:	
Requirements category:	
Operating System	Microsoft Windows 7
Infiniium software version	4.60 (90000 Series, 90000 X-Series, 90000 Q-Series, Z-Series)
File Name:	SetupInfHDMIHEAC0212.exe

Enhancements

- **-** Added support for N7010A probe.

- **-** Added select/unselect all timing function buttons in Device Definition GUI

- **-** Create new parameter "Find Vertical Margin Only" for eye tests

- Added GUI "Edit EDID Details" under Custom Timing GUI to control more parameters for FlexEDID fixture.

Bug Fixes

- Added code to catch missing waveform in middle of eye test

- Improved algorithm to adjust time scale for clock jitter measurement

- Fixed bug on signal scaling for HEAC ARC test to work with baseline 5.xx.

- Improved mask centering algorithm for eye test.

Keysight N5399C/N5399D HDMI Test Software Version 2.11

Released Date:	17 April 2015
Requirements category:	
Operating System	Microsoft Windows 7
Infiniium software version	4.60 (90000 Series, 90000 X-Series, 90000 Q-Series, Z-Series
File Name:	SetupInfHDMIHEAC0211.exe

New Features

- Added QD980 automation support.

Enhancements

- Added support for Infiniium Oscilloscope Software version 5.50.

- Added support for 6xSPT switching module for BIT2100.

- Upgraded FW to use Keysight framework version 4.35.

- Added support for VPrime Flex EDID firmware version 1.4, board rev C.

- Added support for deep color.

Bug Fixes

- Fixed test limits bug for 7-2VL tests.

- Separate out Voff tests as a separate group and improved connection diagram to prompt user to turn off power.

- Improved algorithm to store raw bits for HDMI 2.0 inter-pair skew test. Improved data rate measurement for inter-pair and intra-pair skew tests.

- Added delay time for screenshots when running on baseline 5.xx.

- Other minor bugs and timeouts fixes.

Keysight N5399C/N5399D HDMI Test Software Version 2.10

Released Date:	7 June 2014
Requirements category:	
Operating System	Microsoft Windows 7
Infiniium software version	4.60 (90000 Series, 90000 X-Series, 90000 Q-Series, Z-Series)
File Name:	SetupInfHDMIHEAC0210.exe

Enhancements

- Added support for Infiniium Oscilloscope Software version 5.00.

Keysight N5399C HDMI Test Software Version 2.00

Released Date:	10 April 2014
Requirements category:	
Operating System	Microsoft Windows 7
	Microsoft Windows XP
Infiniium software version	4.60 (90000 Series, 90000 X-Series)
	4.20.005 (9000, 90000, X90000 series
File Name:	SetupInfHDMIHEAC0200.exe

Enhancements

- New and improved algorithm for HDMI 2.0 inter-pair skew

- Fixed bug to check for largest available oscilloscope bandwidth before setting bandwidth

- Fixed bug to recognize HDMI 2.0 license.

Note: This will be the last version to support baseline 4.20.005.

Keysight N5399C HDMI Test Software Version 1.40

Released Date:	10 Dec 2013
Requirements category:	
Operating System	Microsoft Windows 7
	Microsoft Windows XP
Infiniium software version	4.50 (90000 Series, 90000 X-Series,)
	4.20.005 (9000, 90000, X90000 series
File Name:	SetupInfHDMIHEAC0140.exe

Enhancements

- Added test plan capability to run multiple data rates. Data rates are defined by loading a CDF/ user defined templates / manual entry.

- Added DUT automation capability using VPrime's Flex EDID board and/or LAN for PC DUT

Keysight N5399B HDMI Test Software Version 1.10

Released Date:	17 May 2013
Requirements category:	
Operating System	Microsoft Windows 7
	Microsoft Windows XP
Infiniium software version	4.50 (90000 Series, 90000 X-Series, 90000)
	4.20.005 (9000, 90000, X90000 series
File Name:	SetupInfHDMIHEAC0110.exe

Enhancements

- Added Switch Matrix capability.

Bug Fixes

- Fixed HEAC Triggering issue.

- Fixed Auto-scaling issue

Keysight N5399B HDMI Test Software Version 1.04

Released Date:	20 September 2011
Requirements category:	
Operating System	Microsoft Windows XP
Infiniium software version	5.71 (80000 Series), 2.10 (90000 Series and 9000 series) 3.00 (X90000 series)
File Name:	SetupInfHDMIHEAC0104.exe

Enhancements

-   Added support for baseline running on Windows 7.

Keysight N5399B HDMI Test Software Version 1.03

Released Date:	4 March 2011
Requirements category:	
Operating System	Microsoft Windows XP
Infiniium software version	5.71 (80000 Series), 2.10 (90000 Series and 9000 series) 3.00 (X90000 series)
File Name:	SetupInfHDMIHEAC0103.exe

Bug Fixes

-   Fixed the histogram incompatibility issue which caused failure in Clock Single-Ended Tests in Baseline 3.00 and above.

Keysight N5399B HDMI Test Software Version 1.02

Released Date:	1 October 2010
Requirements category:	
Operating System	Microsoft Windows XP
Infiniium software version	5.71 (80000 Series),
	2.10 (90000 Series and 9000 series)
	3.00 (X90000 series)
File Name:	SetupInfHDMIHEAC0102.exe

Bug Fixes

- Fixed the issue of test name is too long and causes error when report is generated with file path that is too long.

- Changed Clock and Data Intra Pair Skew test so that intra-pair skew is now measured referenced on the interval between VMid(Lane+) and VMid(Lane-).

- Changed clock recovery method to semi-automatic when locating the serial pattern for single-ended VL test. The change is to improve consistency when searching for serial pattern.

- Fixed the issue of histogram left and top limits must be greater and right and bottom limits following the changes of baseline version 3.00.

Keysight N5399B HDMI Test Software Version 1.01

Released Date:	16 April 2009
Requirements category:	
Operating System	Microsoft Windows XP
Infiniium software version	5.71 (80000 Series),
	2.10 (90000 Series and 9000 series)
File Name:	SetupInfHDMIHEAC0101.exe

Bug Fixes

- Addressed the issue of actual test lane mismatches with lane configuration when running cable tests with 4 channels connection.

- Addressed the issue of connection diagram does not prompt when changing lane configuration.

Keysight N5399B HDMI Test Software Version 1.00

Released Date:	15 January 2009
Requirements category:	
Operating System	Microsoft Windows XP
Infiniium software version	5.71 (80000 Series),
	2.10 (90000 Series and 9000 series)
File Name:	SetupInfHDMIHEAC0100.exe

Enhancements

- Supports Infiniium 9000-Series Oscilloscopes, with minimum baseline version of 2.10.

- Added HEAC test suites.

- Added equalizer for automotive cable tests.

- Added 4 lane capability for cable tests.

Bug Fixes

- Addressed issue of test aborts when signal voltage level is out of specification.

- Improved connection diagram and configuration.

Note: This will be the last version to support the 80000-series Oscilloscopes. Following releases will only support 90000-series Oscilloscopes.

Keysight N5399A HDMI Test Software Version 02.52

Released Date:	5 December 2008
Requirements category:	
Operating System	Microsoft Windows XP
Infiniium software version	5.40 (80000 Series),
	1.21 (90000 Series)
File Name:	SetupInfHDMI0252.exe

Enhancements

- Supports the Infiniium 90000 Series High Performance Oscilloscope, with minimum baseline version of 1.21.

- Options to enable the custom data rate for clock recovery in Debug Mode.

Bug Fixes

- Addressed the issue of application hangs when the connection page which pops up while running tests is clicked too fast.

- Addressed the issue of application hangs while exporting result as csv file.

- Addressed the issue of select equalizer file dialog pops up when the Receiver Test Equalizer Mode configuration is set to manual-select model.

- Addressed the issue of invalid characters appear in the description of the Transition Time Converter Mode configuration.

- Corrected the diagram in the Probe Offset Calibration wizard and configuration.

Known Issues

- Running the Transmitter Inter-Pair Skew test on past projects which already have this test may result in error while viewing the test results.

- Setting the Raw Clock Frequency configuration other than "Self Measure by Application" for the Cable tests disables the application from measuring the actual value.

Keysight N5399A HDMI Test Software Version 02.50

Released Date:	11 Jan 2008
Requirements category:	
Operating System	Microsoft Windows XP
Infiniium software version	5.40 (80000 Series),
	1.00 (90000 Series)
File Name:	SetupInfHDMI0250.exe

Enhancements

- Supports the Infiniium 90000-Series High Performance Oscilloscope.

- Supports both HDMI 1.3b and HDMI 1.2 Compliance Specification; users can select the HDMI specification on the Setup page of the N5399A Application.

    - Allow users to enter the Device ID to comply with ISO requirement.

    - Included the N5399A Application version on the report page to comply with ISO requirement and ease of maintenances.

- Supports the vertical mask movement in the Eye Diagram Test for better margin presentation.

- Supports the Inter-pair skew's histogram offset setting under the debug mode to enhance the debugging capabilities.

- Support the automatic switching between 10 bits and 20 bits trigger for the Inter-Pair skew.

Bug Fixes

- Addressed the issue of application hangs when the connection page which pops up while running tests is clicked too fast.

- Addressed the issue of application hangs while exporting result as csv file.

- Addressed the issue of select equalizer file dialog pops up when the Receiver Test Equalizer Mode configuration is set to manual-select model.

- Addressed the issue of invalid characters appear in the description of the Transition Time Converter Mode configuration.

- Corrected the diagram in the Probe Offset Calibration wizard and configuration.

- Addressed the Channel's Offset issue that caused misplace of triggering level.

- Modified the rise time and fall time measurement threshold for better presentation.

- Addressed the Single-ended tests' pattern trigger hang issue.

Keysight N5399A HDMI Test Software Version 02.30

Released Date:	13 June 2007
Requirements category:	
Operating System	Microsoft Windows XP
Infiniium software version	5.20.00 Infiniium Baseline
File Name:	SetupInfHDMITest0230.exe

Enhancements

- Supports the HDMI 1.3b Compliance Specification.

- Supports the Probe Offset Calibration; Allows user to calibrate the N5380A SMA Probe head with 3.3V offset voltage.

- Supports the Hide Informative test option; Informative test list can be hidden (optionally) to ease testing operation.

- Supports the Multi-Trial environment test. Allows user to run a specific or all the tests multiple times to obtain results statistically.

- Auto Detect Invalid Signal on Clock and Data Channel to prevent invalid result to the user.

- Ability to detect the older version of HDMI project files and allows these files to be opened as READ-ONLY project.

- Includes the Connection Diagrams for Receiver and Cable test.

Bug Fixes

- Addressed the Rise Time/Fall Time test's edge acquisition issue.

- Addressed the Receiver test's timeout issue.

- Addressed the Issue regarding Eye Diagram offset that causes Mask test failure.

Keysight N5399A HDMI Test Software Version 02.10

Released Date:	26 Dec 2006
Requirements category:	
Operating System	Microsoft Windows XP
Infiniium software version	5.20.00 Infiniium Baseline
File Name:	SetupInfHDMITest0210.exe

Enhancements

- Supports the HDMI 1.3a Compliance Specification.

- Supports the Remote Access, allowing remote client software to control and run test remotely.

- Supports the Mask test for both HDMI 1.2 and HDMI 1.3 Specification, selection for mask revision is available under the Debug Mode.

- Test structure has changed for the Cable/Receiver test. Cable/Receiver test is further divided into Receive Eye and Cable Eye test.

- Supports the Software Time Transition Converter feature for the Cable test. Allows cable test to run without the need to have the hardware time transition converter for the cable calibration process.

- Supports both TP1 and TP2 mask selection for the Cable test. Selection of the Mask Type is available under the Debug Mode.

- Test Structure has changed for the Single Ended test. Single Ended test is changed to allow the test of Clk+/Clk- and Dx+/Dx- to run together to reduce connection in the middle of the test.

- Test Structure has changed for the Single Ended VL test. Changes allow different test Limit for different Pixel Rate for the HDMI 1.3 on different test ID. VL test is divided into VL High Rate test (for pixel rate > 165 MHz) and VL Low Rate (for Pixel rate <= 165 MHz).

- Supports the Auto Mask Movement for the Transmitter Eye Diagram test to automatically search for passing condition whenever the Mask test fails.

- Ability to detect the same Channel Settings on the Compliance Application and alert the user at the Connection Page.

- Ability to detect the Fixture Type for the running test and alert the user whenever user tries to run a test without specifying Fixture Type.

- Ability to allow user to confirm when exiting the software.

- Ability to detect the older version of HDMI project files and allows these files to be opened as READ-ONLY project.

Bug Fixes

- The Fixture Type Name is changed from N5405B to N5405.

- The Over/Undershoot tests are renamed as Informative-Only as these tests were removed from the Compliance Specification 1.3a.

- The Inter-Pair Skew test for Clock Lane is renamed as Informative-Only as this test was removed from the Compliance Specification 1.3a.

- Fixed issues with the Single-Ended Test's Connection Diagram.