Keysight InfiniiVision 4000A X-Series Oscilloscopes

Version 4.08

Released Date:	27 July 2016
Instrument software version:	Revision 4.08
File Name:	4000XSeries.04.08.2016071801.agx

New Features

This software revision includes the following new capabilities:

- Added CXPI triggering and decode option (DSOX4CXPI).

- Added NFC triggering option (DSOX4NFC).

- Added frequency response analysis to Power Application (PSRR and Control Loop Response).

- Added FFT phase math operator.

Enhancements

This software revision includes the following new enhancements:

- Allow all time domain math functions to be loaded into waveform memories.

- Allow waveform memories to be used as sources for math functions.

- Added user-customizable labels for internal setup files.

- Added GUI indicator for channel invert setting.

- Added SCPI grammar for N2820 zoom and R-sense.

KEYSIGHT TECHNOLOGIES

- Added option for a custom time reference location.

- Added "no length control" option to LIN 1.3.

- Improved WaveGen duty cycle granularity.

- Extended WaveGen pulse width limits to 1ns at frequencies >=25kHz.

- Extended probe attenuation ratio limits to 0.001 : 1 (-60dB).

- Power Application – Inrush Current - Added support for DC-input power supplies.

- Power Application – Turn-on/Turn-off - Added support for DC-input power supplies.

- Power Application – Turn-on/Turn-off - Added option to specify measurement threshold levels.

- Power Application – Current Harmonics – Added option to automatically determine line frequency.

Bug Fixes

This software revision includes the following Bug fixes:

- Fixed incorrect DVM values in rare circumstances after toggling channel states.

- Fixed error messages when loading CAN FD .dbc files with data fields longer than 8 bytes.

- Fixed crash when saving H5 files with long path strings.

Version 4.07

Released Date:	20 April 2016
Instrument software version:	Revision 4.07
File Name:	4000XSeries.04.07.2016040802.agx

New Features

This software revision includes the following new capabilities:

- Added remote interface command logger.

Enhancements

This software revision includes the following new enhancements:

- DVM now defaults to DC.

- Cursor state may now be set independently for each cursor.

Bug Fixes

This software revision includes the following Bug fixes:

- Improved USB device mode stability when booting.

- Fixed various LIN symbol file (LDF) parsing errors.

- Fixed 50Ω probe calibration issue with the Power Analysis application.

- Improved performance when entering the IO menu.

- Fixed FFT vertical units when using a 50Ω current probe.

Version 4.06

Released Date:	27 May 2015
Instrument software version:	Revision 4.06
File Name:	4000XSeries04.05.2015051200.agx

New Features

This software revision includes the following new capabilities:

- CAN-FD ISO support has been added to DSOX4AUTO option.

- Control loop capability in the DSOX4POWER option now includes phase view.

Enhancements

This software revision includes the following new enhancements:

- Upto 10 annotations are now supported.

- mDNS On/Off state is now preserved through power cycles.

- Network connection latencies via Telnet or Socket SCPI ports are improved in some situations in networks without NetBIOS.

Bug Fixes

This software revision includes the following Bug fixes:

- LXI identifier now reports Keysight Technologies.

- DVM has been improved when source channel is inverted

Version 4.05

Released Date:	16 February 2015
Instrument software version:	Revision 4.05
File Name:	4000XSeries04.05.2015021000.agx

New Features

This software revision includes the following new capabilities:

- CAN-FD eye testing support has been added to DSOX4AUTO option.

- LIN Symbolic decoding support has been added to DSOX4AUTO option.

- Control Loop measurements have been added to the DSOX4POWER option.

- Bitrate measurement has been added.

- Single shot capability has been added to the Waveform Generator.

- DSOX4POWER option now includes Class D harmonics measurements, including mA/W.

- USB frame triggers have been added – Start of Packet, End of Packet, Reset Complete, Enter Suspend, and Exit Suspend.

Enhancements

- DSOX4POWER option now supports Keysight's N7020A Power rail probe.

- N7020A Power rail probe has a number of behavior improvements; improved autoscale; added calibration detection; improved trigger level interaction; expansion is now center screen.

- DISPlay:BACKLIGHT [ON|OFF] command has been added.

Bug Fixes

- A number of missing localized help screen strings and GUI strings have been added.

- "FFT" is now a valid waveform source for a number of SCPI commands.

- Status byte behaviors are improved.

Version 4.00

Released Date:	1 Nov 2014
Instrument software version:	Revision 4.00
File Name:	4000XSeries.04.00.2014101303.agx

New Features

This software revision includes the following new capabilities

- DSOX4SENSOR - SENT Serial Triggering and Decode option support has been added.

- N2804A/N2805A 100MHz/300MHz differential probe support has been added.

- N7020A Power rail probe support has been added.

- Event lister sidebar capability has been added.

- Frequency peak searching has been added.

- Gated FFT capability has been added.

- New math operators have been added- Smoothing, Maximum Hold, Minimum Hold, Averaging, Envelope.

- New training signals have been added: Sine with Harmonics Distortion; Square wave with Sinusoidal Noise Coupling; SENT; CAN-FD; Keysight Arbitrary waveform.

- New bit rate measurement has been added.

Enhancements

- Product SW has been branded as Keysight.

- DSOX4AUTO – Has been expanded to support CAN FD signal trigger and decode capabilities.

- User configurable sidebar capability has been added.

- New sidebar counter readout has been added.

- Swiping capabilities have been added to waveform, lists, menus, segments.

- DSOX4POWER – Several new capabilities have been added

  - Switching Loss
    - Added an Offset Calibration feature to correct the oscilloscope/probe offset error.

- o Rds(on) & Vce(sat) Analysis
  - ▪ New analysis that indicates whether a switching device is operating near the values published in the device's data sheet.
- o Deskew
  - ▪ After completion, allow users to restore the oscilloscope's vertical and horizontal setting prior to executing Deskew.
- o PSRR
  - ▪ Improved the throughput/speed.
  - ▪ Improved the vertical scaling during the sweep.
  - ▪ Changed the trigger source to the internal WaveGen for stability.
- o Power Quality
  - ▪ Pressing Apply will now install all the measurements in the sidebar

- Annotation has been expanded to 4 annotations.

- Waveform label lengths have been increased to 32 characters.

- Users can now save analysis results to thumb drives; this includes results for Cursors data, Measurement results, Mask Test statistics, Search results, Segment timestamps.

- Phase setting between the two waveform generators has been added for Sine, Sine Cardinal, Ramp, Gaussian, Pulse & Cardiac signals.

Bug Fixes

- DSO4XPOWER

  - o **Efficiency**– Fixed *Auto Setup* problem with certain probes

Version 3.22

Oscilloscope Firmware Version 03.22.2014052101
Release Date: May 21, 2014
File Names: 4000XSeries03.22.2014052101.agx

This version of the oscilloscope firmware includes the items below:

<u>Enhancements</u>
- CANdb symbolic decode performance has been improve in a number of situations.
- N2820A/N2821A high sensitivity current probe – Range for the user defined resistance has been expanded and now is 10 microOhms to 1 MegaOhm
- Java application security enhancement to track Java engine security improvements
- USB SQ application fonts now have improved legibility
- Waveform Generator vertical accuracy is now improved in a number of situations.
- V average measurement resolution is much improved for small measurements

- Power application improvements
  - Switching loss measurement now behave better around 0 amps
  - Inrush current measurement is now more reliable
  - Efficiency measurement
    - Scaling of waveforms is now optimized, less clipping in some situations
    - Added DC to DC, DC to AC, AC, to AC efficiency measurement.
    - Absolute current is used to give correct result, even if probe is hooked up backwards
  - Current Harmonic measurement
    - Now uses BH window as default, just like the U1881A application
  - Transient response – triggering is made more flexible

Defects Addressed
- The Tablet viewer will now correctly launch on recent instruments
- :MEAS:DEF THR, PERCent,95,10,5 no longer given an out of range error
- Current Harmonic measurement now correct scales grid at decibels to Vrms settigns change.

Version 3.21

Oscilloscope Firmware Version 03.21.20140110001
Release Date: January 21, 2014
File Names: 4000XSeries.03.21. 20140110001.agx

This version of the oscilloscope firmware includes the items below:

Enhancements
- None

Defects Addressed
- Dual bus lister now operates as intended when both busses are UART

Version 3.20

Oscilloscope Firmware Version 03.20.2013082300
Release Date: September 3, 2013
File Names: 4000XSeries.03.20.2013082300.agx

This version of the oscilloscope firmware includes the items below:

Enhancements
- Zone triggering and segmented memory can now be used at the same time.
- CAN symbolic decode, trigger and search was added to the current CAN serial capability. It uses DBC files to load the symbols.

- LIN triggering for parity and checksum errors was added.
- SPI trigger can be entered using a Hex entry pad.
- In XY mode the user can set the scale between 50ms/div – 200ns/div.
- In Roll mode when stopped the user can zoom in around their reference point without any movement.
- ΔY/ΔX (Slew Rate) readout was added to the cursors sidebar tab.
    - o   :MARKer:DYDX? Added to support via remote interfaces
- Added Negative Duty Cycle measurement.
- We have enabled the ability to navigate search events using the :SEARch:EVENt remote command.
- N2818A/19 differential probe support has been added.
- N2797A extreme temperature active probe support has been added.

Defects Addressed
- We have improved the ability to abort a :DIGitize remote command.
- The Vpp measurement and cursor behavior have been improved for the N2820A/21 high sensitivity current probes.
- LIN 2.0 decoding now better handles the Checksum field.
- For I2C decoder search: previously, read packets sometimes erroneously found during write searches.

Version 3.12

Oscilloscope Firmware Version 03.12.2013041700
Release Date: April 23, 2013
File Names: 4000XSeries.03.12. 2013041700.agx

This version of the oscilloscope firmware includes the items below:

Enhancements
- MSO threshold calibration has been improved and is now better centered about 0 Volts.
- The default cursor placement has been changed; they are no longer reset to the same values.
- N2820A/21 high sensitivity current probes – the range of resistance supported by the user defined resistance probe head is now 1 milliohm to 10 Ohms.

Defects Addressed
- All segmented memory segments are now saved when using binary and ASCII XY formats.
- Measurements statistics are now reset for the 10th tracked measurement

Version 3.11

Oscilloscope Firmware Version 03.11.2013030100
Release Date: March 01, 2013
File Names: 4000XSeries.03.11. 2013030100.agx

This version of the oscilloscope firmware includes the items below:

Enhancements
• Final localized help screens added for the new 3.10 capabilities.

Defects Addressed
• None

Version 3.10

Oscilloscope Firmware Version 03.10.2013020700
Release Date: Feb. 12, 2013
File Names: 4000XSeries.03.10.2013020700.agx

This version of the oscilloscope firmware includes the items below:

Enhancements
• DSOX4USBSQ option support has been added – This option allows for signal quality testing for low, full and high speed USB 2.0 devices.
• N2820A high sensitivity 2 channel current probe support has been added. This allows current measurements down to micro amp range while simultaneously viewing the large signal behavior on the second channel of the probe.
• Saving of files via email has been added.
• A multichannel Hdf5 file format has been added, allowing direct input into Agilent's InfiniiView offline viewer SW application.
• Hex key pad entry has been improved.
• The delay is now displayed when in Roll mode.
• :TRIGger:LEVel:ASETup has been added, this will set the trigger level of all displayed channels to 50% of the signal on screen.

Defects Addressed
• The Set trigger to 50% function now behaves appropriately when channels are AC coupled.
• Wavegen1&2 now recover better when overload is detected.
• Wavegen2 noise floor is improved for DC signals.
• Help screens for grayed out soft keys are now accessible via touch.
• The Sine w/ Glitch training signal now has repeatable location of glitch on the sine wave.
• Arbitrary Waveform is now preserved across a power cycle. It is no longer defaulted.

Version 3.01

Oscilloscope Firmware Version 03.01.20121212001
Release Date: Jan. 10, 2011
File Names: 4000XSeries.03.01.20121212001.agx

This version of the oscilloscope firmware includes the items below:

<u>Enhancements</u>
- Averaging will now enable the display and measurement of zoomed waveforms when entering Zoom mode while stopped.
- A hexadecimal entry keypad has been added.
- The Counter measurement will now display up to 8 digits when an external 10MHz reference is selected.
- For the N2750A probe family, the probing mode is now displayed when changed from the probes action button.
- When in TV trigger mode, the trigger status line now indicates the trigger type, Field1,Field2, AllFields, etc., instead of just the trigger source channel.
- When in Roll mode, touching the Roll indicator in the upper right of screen will now bring up the Horizontal menu, rather than Trigger menu.
- An "Add Annotation" choice has been added to the zoom box list of actions.
- The :BLANk, :VIEW, and :STATus commands now accepts WMEMory<N> as an argument.
- Measurement statistics now accumulate with successive SINGLE acquired waveforms.
- The FFT resolution has been improved.

<u>Defects Addressed</u>
- Cursors readings now reliably update in the side bar area after certain changes, when assigned to the Math signal.
- Cursors will now track the reference waveform when selected as the source.
- Cursor readouts will now track units changed on the math waveform when the math operator is 'Chart'
- Cursor handles are now placed correctly after changing cursor values while lister is full screen.
- When measuring an FFT, cursors will now be able to span the full zoomed window.
- Zone windows now draw more consistently when moving to/from main and zoom windows.
- Change of the Standard deviation to/from Relative Standard deviation while stopped now clear the statistics.
- Mask statistics will now update to proper language without cycling power when selected language is changed.
- Mask 'Save On' functionality now works appropriately for SINGLE acquisitions and :Digitize remote command.
- FlexRay TP1 Mask Test now works if the "run until" setting is something other than "forever".
- The Reference waveform is now more consistently cleared from the screen, when the clear reference action is done in Reference Waveform menu.
- When refreshing the Save webpage of scope when Reference is selected, this no longer generates a "parse error" on certain following actions.
- The waveform search marks are now cleared when the source waveform is cleared.

- The differentiate math operator now correctly represents signal amplitude after many acquisitions when using the math averaging operator.
- The :WAV:DATA? query now works for the RAW data format when running.
- The runt Search capability now works correctly the first time after a Default Setup.
- The oscilloscope now more gracefully handles a number of unsupported thumb drives.
- :DVM:FREQ will no longer return stale data when current waveform is blank.
- FFT noise floor has been improved.
- Networking behavior now conforms to LXI v1.4 standards.

Version 3.00

Released Date:	September 2012
Requirements category (e.g., instrument software version):	Revision 3.00
File Name:	4000XSeries.03.00.201209XXXX.agx

Initial Release