MD2 High-Speed Digitizer Instrument Drivers

2.3.6 Version Information

Released Date:	July 11, 2017
Operating systems:	32-bit or 64-bit OS: Windows 7 SP1 Windows 8.1 Windows 10
Required Software:	Keysight IO Libraries Suite version 2017 - 18.0.21916.2, or later
Supported Instruments	U5303A, U5309A, U5310A, M9709A, M9703B, M9710A, M9203A
File Names:	MD2_Software_DVD_2.3.6.exe

Important Notes (Repeated from previous release)

1. Warning: MD2 2.x and later are not backward compatible with MD2 1.x!
See details here.

2. For U5310A users, MD2 release 2.2 requires an update of the module CPLD. Please refer to the section **Utilities > CPLD Firmware Upgrade** in the **U5310A User Manual** for more information about how to update your U5310A.

3. For M9703B, U5303A and U5309A users, please note that MD2 release 2.2 requires an update of the Module Control FPGA (version 4.2.19 for M9703B, 1.0.353 for U5309A and 1.0.407 for U5303A, or newer). Please refer to the section Firmware Upgrade Utility in the Product's User Manual for more information on how to update the Control FPGA.

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New Features

- M9203A: Added support for PXIeClk100 sampling clock reference.

- M9709A: Added support for 'gentle failure'. This allows the disabling of channels failing the self-calibration to continue using the instrument. (Requires an update of the control FPGA)

- U5309A: Added new AVG+TSR Triggered Simultaneous acquisition and Readout in Averager mode.

- U5309A: Added Low Power Standby mode.

- U5310A: Added new option CST for Triggered Streaming.

- U5310A: Added new single channel option CH1.

Bug Fixes

- MD2 Installer: Corrected install failure on system with VS2017 (#480675).

- M9703B: Corrected synchronization of M9703B modules which was introducing interleaving spurs (#477431).

- M9203A, M9703B, U5303A: Corrected MaxSamplesPerChannels in DDC mode for decimation ratios >4 (#477003).

- M9203A, M9703B, U5303A: Correction in DDC mode for decimation ratios >256 which were showing spurs (#477426).

- M9703B, M9709A, M9710A: Corrected time skew of AXIe SYNC trigger source to align T0 between models (#482075).

- M9710A, U5310A: Control IO signal renamed to "Out-SamplingClockDivBy128" (was incorrectly named "SamplingClockDivBy32") (#475985).

- M9710A, U5310A: Input Filter Max Frequency corrected: actual (single) allowed value is 2 GHz (driver was incorrectly returning 1 GHz) (#476766).

- U5310A: Improved gain calibration in interleaved mode (10 GS/s sampling rate) (#482456).

- M9203A, M9709A, M9710A, U5303A, U5309A, U5310A: Corrected Trigger Output Source for values other than "TriggerAccepted" (#482074).

- M9203A, M9709A, U5303A, U5309A: Corrected behavior according to the value of Trigger Output Enabled. Actual value was not taken into account and output was always enabled (#482074).

Known issue and solution:

- PCIe Digitizer Intermittent Detection

Problem description: The U53xxA digitizer models may exhibit an intermittent PCIe link training issue when installed in computers equipped with processors based on the Intel Skylake microarchitecture. In this case, the digitizer may not be detected by the host computer. These PCIe link issues can happen from time to time at boot or after a reboot.

Solution: If your system exhibits such unexpected behavior, you must use both the new Control FPGA firmware for specific computer interoperability U53xxACTRL_DPUyyy_Specific1.mcs and MD2 driver version 2.3 or later.

Please contact support at acqiris_support@keysight.com to receive the procedure to upload this new control FPGA firmware.

For more details about this release, please see the following file:

<Program Files or installation directory>\Keysight\MD2\ReleaseNotes.txt

2.2.12 Version Information

Released Date:	April 28, 2017
Operating systems:	32-bit or 64-bit OS: Windows 7 SP1 Windows 8.1 Windows 10
Required Software:	Keysight IO Libraries Suite (version 17.2 Update 2 or later)
Supported Instruments	U5303A, U5309A, U5310A, M9709A, M9703B, M9710A, M9203A
File Names:	MD2_Software_DVD_2.2.12.exe

Important Notes

1. Warning: MD2 2.x and later are not backward compatible with MD2 1.x!
See details here.

2. For U5310A users, MD2 release 2.2 requires an update of the module CPLD. Please refer to the section **Utilities > CPLD Firmware Upgrade** in the **U5310A User Manual** for more information about how to update your U5310A.

3. For M9703B, U5303A and U5309A users, please note that MD2 release 2.2 requires an update of the Module Control FPGA (version 3.1.57 for M9703B, 1.0.353 for U5309A and 1.0.407 for U5303A, or newer). Please refer to the section Firmware Upgrade Utility in the Product's User Manual for more information on how to update the Control FPGA.

This Corrective Release addresses issues affecting only the following digitizer models: M9709A, M9710A, U5309A, U5310A.

Bug Fixes

- M9709A: Improved self-calibration to avoid failing validation step during T0 alignment (#476426).

- M9710A: Corrected internal issue, not affecting the end user (#476112).

- M9710A, U5310A: Improved self-calibration for better performance and to eliminate "Unexpected response from instrument" errors due to "RT bit alignment".

- U5309A: Corrected "Unexpected response from instrument" error while calibrating after an abort in AVG mode (#477064).

For more details about this release, please see the following file:

<Program Files or installation directory>\Keysight\MD2\ReleaseNotes.txt

2.2.8 Version Information

Released Date:	February 24, 2017

Operating systems:	32-bit or 64-bit OS:
	    Windows 7 SP1
	    Windows 8.1
	    Windows 10
	    Linux with kernel 2.6 & 3

Required Software:	Keysight IO Libraries Suite (version 17.2 Update 2 or later)
Supported Instruments	U5303A, U5309A, U5310A, M9709A, M9703B, M9710A, M9203A
File Names:	MD2_Software_DVD_2.2.8.exe LinuxMD2-2.2.9 tar.gz

Important Notes

1. Warning: MD2 2.x and later are not backward compatible with MD2 1.x!
See details here.

2. For U5310A users, MD2 release 2.2 requires an update of the module CPLD. Please refer to the section **Utilities > CPLD Firmware Upgrade** in the **U5310A User Manual** for more information about how to update your U5310A.

3. For M9703B and U5303A users, please note that MD2 release 2.2 requires an update of the Module Control FPGA (version 3.1.57 for M9703B and 1.0.407 for U5303A, or newer). Please refer to the section Firmware Upgrade Utility in the Product's User Manual for more information on how to update the Control FPGA.

Bug Fixes

- Correction of 32 bit MATLAB files (*FetchMultiRecordWaveform* function limitation) (#473561).

- M9709A Multi-module Synchronization: Corrected ConfigureSlaves call failing (#473570).

- M9710A: Improve channel gain on even channels (#473393).

- M9710A: Corrected channel alignment error after switching between channel trigger sources (#474926).

- M9710A: Corrected channel alignment error when issuing a software trigger (#475013).

- M9710A: Corrected External Reference lock loss not always detected (#474925).

- M9203A-DDC/M9703B-DDC/U5303A-DDC: Corrected freeze of DDC acquisitions with external trigger (#473210).

- U5310A-AVG: Corrected supported decimation factors and LP filters for the time interleaved mode (#473911).

- U5310A-AVG: Corrected erroneous timestamps values (#474821).

- U5310A-AVG: Correction for corrupt data with decimation and large trigger delays

- U5309A: Corrected InitiateAcquisition performance -degradation in release 2.2.5 (January 2017).

For more details about this release, please see the following file:

<Program Files or installation directory>\Keysight\MD2\ReleaseNotes.txt

2.2. Version Information

Released Date:	January 12, 2017
Operating systems:	32-bit or 64-bit OS: 　　　Windows 7 SP1 　　　Windows 8.1 　　　Windows 10 　　　Linux with kernel 2.6 & 3
Required Software:	Keysight IO Libraries Suite (version 17.2 Update 2 or later)
Supported Instruments	U5303A, U5309A, U5310A, M9709A, M9703B, M9710A, M9203A
File Names:	MD2_Software_DVD_2.2.5.exe LinuxMD2-2.2.6 tar.gz

Important Notes

1. Warning: MD2 2.x and later are not backward compatible with MD2 1.x!
See details here.

2. For U5310A users, MD2 release 2.2 requires an update of the module CPLD. Please refer to the section **Utilities > CPLD Firmware Upgrade** in the **U5310A User Manual** for more information about how to update your U5310A.

3. For M9703B and U5303A users, please note that MD2 release 2.2 requires an update of the Module Control FPGA (version 3.1.57 for M9703B and 1.0.407 for U5303A, or newer). Please refer to the section Firmware Upgrade Utility in the Product's User Manual for more information on how to update the Control FPGA.

New Features

- M9710A support

- M9703B: support of new multi-purpose I/O: In-TriggerEnable and In-ArmTrigger. (Requires an update of the control FPGA)

- U5310A-AVG: Add decimated sampling rates and associated filters.

- U5310A: Set Trigger Level limits to +/-0.75 of the channel Range.

- M9709A: Added Smart Calibration, *Calibration SaveToFile* and *LoadFromFile* support.

- M9703B: Added support for *In-ArmTrigger* and *In-TriggerEnable* for the ControlIO1/2 (Requires Firmware upgrade, see **User Manual > Utilitites > Firmware Update Utility**).

Bug Fixes

- Correction for AVG timestamps and AVG trigger delay.

- U5309A: Improve *InitiateAcquisition* performance.

- U5309A: Corrected *MaxSamplesPerChannel* in AVG and PKD modes when one channel is disabled.

- U5310A: Corrected bad samples at end of trace in AVG mode when decimation is enabled.

- M9703B, M9203A, U5303A DDC and Magnitude trigger: Corrected some unexpected PC crash during data fetch operations.

- Corrected Averager examples showing corrupted data with high number of averages.

Known limitation

- IVI-COM MATLAB driver: *FetchMultiRecordWaveform* function cannot be used with more than 2 records.

For more details about this release, please see the following file:

⟨Program Files or installation directory⟩\Keysight\MD2\ReleaseNotes.txt

2.1. Version Information

Released Date:	24 November 2016
Operating systems:	32-bit or 64-bit OS:
	Windows 7 SP1
	Windows 8.1
	Windows 10
	Linux with kernel 2.6 & 3
Required Software:	Keysight IO Libraries Suite (version 17.2 Update 2 or later)
Supported Instruments	U5303A, U5309A, U5310A, M9709A, M9703B, M9203A
File Names:	MD2_Software_DVD_2.1.6.exe
	LinuxMD2-2.1.5.tar.gz

Important Note

Warning: MD2 2.x and later are not backward compatible with MD2 1.x!

With AgMD2 2.x, the backward compatibility of the IVI-C driver is broken for
the following functions:
  AgMD2_FetchWaveformInt8
  AgMD2_FetchMultiRecordWaveformInt8
  AgMD2_ReadWaveformInt8

Their function signatures have changed in line with IVI standard evolution: the WaveformArray
parameter type has been updated from *ViChar[]* to *ViInt8[]*.

With this change, AgMD2 1.x and AgMD2 2.x binary files remain compatible: user binaries
compiled with AgMD2 1.x will work with the 2.x (and later) driver, for both IVI-C and IVI-COM
interfaces. However, existing source code must be updated to allow the compilation with AgMD2
2.1 (and later).

New Features

- U5310A support

- U5303A AVG: Reduced minimum record size to 1.

Bug Fixes

- U5303A/U5309A: Corrected intermittent "*Unexpected response from the instrument.
  Expected Acq Done interrupt*" error returned by WaitForAcquisitionComplete() function in
  the middle of acquisitions.

- U5303A: Corrected corrupted averager data for very large accumulations.

- U5303A-SR0: Corrected trigger position in very small records.

- U5309A: Corrected intermittent Acquisition running error in TSR mode.

- U5309A: Corrected erroneous "*Unknown timebase mezzanine*" reported on some PCs.

- U5309A: Improved t0 position for internal (channel) digital trigger (on both –CH2 and –CH8 variants).

- M9703B: Read/WriteIndirect32 now requires 64-bit alignment

- M9709A: Corrected t0 placement with Internal (channel) digital trigger.

- Corrected value of actual averages returned by FetchAccumulatedWaveform functions.

- Improve code examples.

For more details about this release, please see the following file:

<Program Files or installation directory>\Keysight\MD2\ReleaseNotes.txt

1.12 Version Information

Released Date:	6 June 2016
Operating systems:	32-bit or 64-bit OS: Windows 7 SP1 Windows 8.1 Windows 10 Linux with kernel 2.6 & 3
Required Software:	Keysight IO Libraries Suite (version 17.2 or later)
Supported Instruments	U5303A, U5309A, M9709A, M9703B, M9203A
File Names:	MD2_Software_CD_1.12.6.exe LinuxMD2-1.12.5.tar.gz

Important Note:

For M9703B and U5303A users, please note that MD2 release 1.12 requires an update of the Module Control FPGA (version 3.1.9 for M9703B, version 1.0.407 for U5303A). Please refer to the section Firmware Upgrade Utility in the Product's User Manual for more information on how to update the Control FPGA.

New Features

- Support of M9203A with following options: INT, FDK, DDC, TSR, CB0, CB2, BB1.

- U5303A: New options SS2, DDC, CB2 and FT1.

- M9703B: Added support for flash storage of bitfiles.

- M9703B: Added binary decimation.

- M9703B: Improve Trigger level accuracy.

- M9703B: Added support for multi-module synchronization.

- M9709A: Added support for multi-module synchronization.

- M9703B: Added support of various trigger output sources.

Bug Fixes

- U5309A: Corrected InitialXOffset in Averager mode.

- M9703B: Changed type of NumPointsPerRecord argument of function *AgMD2_DDCCoreFetchWaveformInt16* to *ViInt64* in IVI-C interface.
  WARNING: This change breaks the binary compatibility with the previous release MD2 1.11

for applications using this function. Function *AgMD2_DDCCoreFetchWaveformInt16 was* first introduced in MD2 1.11. Applications that are not calling this function are not affected.

For more details about this release, please see the following file:

<Program Files or installation directory>\Keysight\MD2\ReleaseNotes.txt

1.11 Version Information

Released Date:	21 March 2016
Operating systems:	32-bit or 64-bit OS: Windows 7 Windows 8.1 Windows 10
Required Software:	Keysight IO Libraries Suite (version 17.2 update 1 or later)
Supported Instruments	U5303A, U5309A, M9709A, M9703B
File Names:	MD2_Software_CD_1.11.5.exe

Important Note:

For M9703B users, please note that MD2 release 1.11 requires an update of the Module Control FPGA. Please refer to the section Firmware Upgrade Utility in the Product's User Manual for more information on how to update the Control FPGA.

For U5303A users, if you were using an MD2 release anterior to 1.6, an update of the Module Control FPGA would be required (version 1.0.285 or newer). Please refer to the section Firmware Upgrade Utility in the Product's User Manual for more information on how to update the Control FPGA.

New Features

- Support of M9703B with following options DDC/LDC.

- Support of Magnitude Trigger (with DDC/LDC) on M9703B.

- Smart Calibration on M9703B and U5309A.

- Add partial readout support for aborted averages on U5303A-AVG and U5309A-AVG.

- Add IFDL support on M9703B-FDK.

Bug Fixes

- Correct InitialXTime values for all instruments.

For more details about this release, please see the following file:

<Program Files or installation directory>\Keysight\MD2\ReleaseNotes.txt

1.8 Version Information

Released Date:	16 December 2015
Operating systems:	32-bit or 64-bit OS: Windows 7 Windows 8.1 Linux with kernel 2.6 & 3
Required Software:	Keysight IO Libraries Suite (version 17.1 or later)
Supported Instruments	U5303A, U5309A, M9709A, M9703B
File Names:	MD2_Software_CD_1.8.5.exe LinuxMD2-1.8.4.tar

Important Note:

For U5303A users, please note that MD2 release 1.6 or later requires an update of the Module Control FPGA (version 1.0.285 or newer). If not already done previously, please refer to the section Firmware Upgrade Utility in the Product's User Manual for more information on how to update the Control FPGA.

New Features

- Support of M9703B with following options DGT, FDK, B01, CB1, CB2.

- New Soft Front Panel for Keysight MD2 Digitizers.

- Enhanced PCIe interface.

- U5309A and M9709A: Improved data acquisition robustness.

- M9703B: Minor optimization of analog gain and offset performance.

Bug Fixes

- Corrected InitialXTime values returned by Fetch and Read functions for short record sizes.

- U5309A: Corrected erroneous data with non-zero trigger delay.

- U5309A: Corrected issue causing unexpected cal signal frequency.

- M9703B: MemoryBank attributes selected only when selector is correct.

- Corrected dead data in combined mode with M40 option.

- Corrected seldom bad spectra in AVG mode.

For more details about this release, please see the following file:

<Program Files or installation directory>\Keysight\MD2\ReleaseNotes.txt

1.6.9 Version Information

Released Date:	14 July 2015
Operating systems:	32-bit or 64-bit OS: 　　　　Windows 7 　　　　Windows 8.1 　　　　Linux with kernel 2.6 & 3
Required Software:	Keysight IO Libraries Suite (version 17.1 or later)
Supported Instruments	U5303A, U5309A, M9709A
File Name:	MD2_Software_CD_1.6.9.exe

Important Note for existing U5303A Users :

This MD2 1.6 release requires an update of the Module Control FPGA (version 1.0.285 or newer). Please refer to the section Firmware Upgrade Utility in the Product's User Manual for more information on how to update the Control FPGA.

New Features

- Added High Fidelity digitizer (BB1) option for U5303A (SR2 only).

Bug Fixes

- Corrected wrong trigger position when using various full scale ranges on U5309A/M9709A (#387448).
- Corrected binary decimation in multi-record mode at low sampling rates on U5303A/U5309A (#371756)
- Enforce limitation of the decimation factor to 32 when numRecords > 1 (was allowed by the driver even though not supported) on U5303A/U5309A.
- U5303A SR3: Corrected record index failures for records #0 and #1 during TSR acquisitions.

For more details about this release, please see the following file:

<Program Files or installation directory>\Keysight\MD2\ReleaseNotes.txt

1.6.4 Version Information

Released Date:	April 2015
Operating systems:	32-bit or 64-bit OS: Windows 7 Windows 8.1 Linux with kernel 2.6 & 3
Required Software:	Keysight IO Libraries Suite (version 16.3 update 2 or later)
Supported Instruments	U5303A, U5309A, M9709A
File Name:	MD2_Software_CD_1.6.4.exe

Important Note for existing U5303A Users:

This MD2 1.6 release requires an update of the Module Control FPGA (version 1.0.285 or newer). Please refer to the section Firmware Upgrade Utility in the Product's User Manual for more information on how to update the Control FPGA.

New Features

- Added M9709A support.
- Added Continuous Simultaneous acquisition and Readout (CSR) support for U5303A (SR1 and SR2 only).
- Added U5303A SR3 variant.

Bug Fixes

- Corrected wrong T0 position when using decimation factors > 1 on U5309A-CH2 (#349131).
- Corrected acquisition issue caused by mode change to/from average on U5309A-AVG (#350593).
- Corrected erroneous time-out when switching from TSR to normal acquisition mode (#353951).
- Corrected wrong behaviour of OffsetWithinRecord parameter in FetchAccumulatedWaveform functions (#351816).
- Corrected wrong T0 position on U5309A-CH2 SR0 and SR1 variants in internal trigger mode (#349131).
- Removed unsupported sample rates in average mode (#342517).

Known defects

- The example code file "CPP_IVICOM_TSR.cpp" contains an error. Line 199, which reads: dataInVolts[int(pFirstValidPoint[record]) + point] = pData[int(pFirstValidPoint[record]) +

point] * scaleFactor + scaleOffset; should be replaced with the following: dataInVolts[point+numPointsPerRecord*record] = pData[int(pFirstValidPoint[record]) + point] * scaleFactor + scaleOffset;

- The LabVIEW example Agilent MD2-Averager.vi contains two errors. The ApplySetup VI must be called before the call to the Self Trigger Initiate Generation VI to insure that the active trigger source is configured to SelfTrigger before starting the generation of the self–trigger signal (alternatively the calls to the Self Calibrate and Self Trigger Initiate Generation VIs can be swapped).

   To allow the detection of the AVG option required for this example, replace the argument value LOGICAL_NAME by INSTRUMENT_INFO_OPTIONS in the Get Attribute call used to check the AVG option.

- The Agilent MD2.lvlib General Settings\Version Number indicates a wrong version, it should be 1.3.4.0.

For more details about this release, please see the following file:

<Program Files or installation directory>\Keysight\MD2\ReleaseNotes.txt

1.4 Version Information

Released Date:	2014-08-19
Operating system:	Windows 7
Required Software:	Keysight IO Libraries Suite
Supported Instruments	U5303A, U5309A
File Name:	MD2_Software_CD_1.4.3.exe

New Features

- Added U5309A 8-channel (-CH8) support, and new real-time processing options for the 2-channel (-CH2) version: average (AVG), peak detection (PKD) and Triggered Simultaneous acquisition and Readout (TSR).

Bug fixes

- Corrected allowed input offset range for U5309A (#341434).
- First trigger event no longer ignored after calibration on U5303A (#329544).
- Invalid sampling rate values no longer allowed on U5303A-SR0 (#338695).
- Added missing SafeArrayDestroy call in C++ examples (#331016).
- Corrected invalid InitialXTime values when using decimated sampling rates (#341339).

Known issues:

- U5309A-CH2 only: in digitizer mode, and at sample rates of 1 GS/s or less, the internal (digital) trigger position returned by the data readout is wrong (constant time offset). This does not affect other acquisition modes such as averager or peak detection.

For details about previous versions, please see the following file:

<Program Files or installation directory>\Keysight\MD2\ReleaseNotes.txt

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