Release Notes for Data Acquisition Toolbox™

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Release Notes for Data Acquisition ToolboxTM

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R2013a

Version: 3.3

New Features: Yes Bug Fixes: Yes

Support for clocked digital I/O on National Instruments devices using session-based interface

You can now use the session-based interface with National Instruments® digital devices to acquire and generate clocked digital data.

Support Package for Digilent Analog Discovery design kit used in circuits courses

You can now install Digilent Analog Discovery TM hardware via the Support Package Installer. You can use Digilent's analog input capability with the session-based interface.

Support for array binary-to-decimal conversion

You can now convert arrays of binary values to hexadecimal or decimal values, and vice versa using the conversion functions.

R2012b

Version: 3.2

New Features: Yes Bug Fixes: Yes

Support for Digital I/O on National Instruments devices using session-based interface

You can now use the session-based interface with National Instruments digital devices to acquire and generate non-clocked digital data.

AutoSyncDSA Property for automatically synchronizing National Instruments DSA devices using RTSI or PXI bus in session-based interface

You can use the AutoSyncDSA property to synchronize PXI or PCI devices on the same chassis in a session.

Support for additional National Instruments devices using session-based interface

You can use National Instruments digital devices with the session-based interface. See the Supported Hardware page for a list of supported National Instruments digital devices.

Additionally you can use NI 9232 and NI PXIe-4357 SC Express RTD device with the session-based interface.

R2012a

Version: 3.1

New Features: Yes Bug Fixes: Yes

Session Synchronization Capability

You can now synchronize operations in the session-based interface using hardware triggers and scan clocks.

Support Added for Microphone Channels

You can now perform microphone measurements on National Instruments devices using the session-based interface.

Support Added for IEPE Channels

You can now perform generic IEPE measurements on National Instruments devices using the session-based interface.

Support Added for New National Instruments CompactDAQ Chassis

Additional data acquisition support was added for the Ethernet chassis NI cDAQ-9188 and these 1-Slot CompactDAQ chassis:

NI~cDAQ-9171

NI cDAQ-9181

NI~cDAQ-9191

Support Added for New National Instruments Devices

Additional data acquisition hardware support was added for these National Instruments devices:

NI USB-6341	NI PCIe-6509
NI USB-6343	NI PXI-4472
NI USB-6351	NI PXI-6602
NI USB-6353	NI PXI-6608
NI USB-6356	NI PXI-6624
NI USB-6361	NI PXI-6723
NI USB-6363	NI PXI-6733
NI USB-6366	NI PXIe-4492
NI PCI-6601	NI PXIe-4497
NI PCI-6602	NI PXIe-4499
NI PCI-6713	NI WLS-9163

Support Added for New Measurement Computing Devices

Additional data acquisition hardware support was added for USB-1608G, USB-1608GX and USB-1608GX-2AO. You can use these Measurement ComputingTM devices in the legacy interface.

R2011b

Version: 3.0

New Features: Yes Bug Fixes: Yes

Expanded Support for National Instruments Devices in the Session-Based Interface

You can now use most supported National Instruments devices in the session-based interface. See the Supported Hardware page for a list of supported National Instruments devices.

Support Added for Bridge Measurements

You can now perform bridge measurements on National Instruments using the session-based interface.

Support Added for RTD Channels

You can now perform RTD measurements on National Instruments using the session-based interface.

Support Added for New Thermocouple Device

You can now use the National Instruments NI USB-TC01 Thermocouple measurement device with Data Acquisition Toolbox TM , using the session-based interface.

Support Removed for Two National Instruments USB Devices

Support for NI USB-9263 and NI USB-9264 devices removed from the legacy interface of Data Acquisition Toolbox. Use these devices with the session-based interface.

R2011a

Version: 2.18 New Features: Yes Bug Fixes: Yes

Support Added for Counters and Timers

You can now use counter and timer subsystems on National Instruments CompactDAQ devices in Data Acquisition Toolbox.

Support Added for IEPE Accelerometer Measurements

You can now directly access IEPE accelerometer measurements on a National Instruments CompactDAQ device.

Support Added for NI-DAQmx Devices

Additional data acquisition hardware support was added for NI-DAQmx Version 9.2.1 devices as follows:

NI PCIe-6509	NI USB-6351
NI PXIe-4492	NI USB-6353
NI PXIe-4497	NI USB-6356
NI PXIe-4499	NI USB-6361
NI USB-6341	NI USB-6363
NI USB-6343	NI USB-6366

Note You must use NI-DAQmx driver Version 9.1 or greater with Data Acquisition Toolbox.

New Hardware Support for National Instruments Chassis-Based Devices

Additional data acquisition hardware support was added for NI 9222, and NI 9223 devices.

64-Bit Windows Support

You can now use the session-based interface of Data Acquisition Toolbox with a Windows $^{\circledR}$ 64-bit system. The legacy interface does not support use of the 64-bit system.

NI-DAQmx Driver Requirement

You must use Version 9.1 of the NI-DAQmx driver with Data Acquisition Toolbox.

R2010b

Version: 2.17 New Features: Yes Bug Fixes: Yes

Support Added for National Instruments CompactDAQ Devices

You can use the session-based interface of the Data Acquisition Toolbox to communicate with National Instruments CompactDAQ devices. Currently the toolbox only supports devices with analog input and output channels. For a complete list of supported CompactDAQ devices, visit the Data Acquisition Toolbox Supported Hardware page at the MathWorks Web site.

Current and Thermocouple Measurements for CompactDAQ Devices

You can use CompactDAQ devices that support current and thermocouple measurement types with the session-based interface of the Data Acquisition Toolbox.

New Hardware Support

Data Acquisition Toolbox now supports the analog and digital I/O subsystems in the National Instruments Educational Laboratory Virtual Instrumentation Suite (ELVIS) II+ devices.

R2010a

Version: 2.16 New Features: Yes Bug Fixes: Yes

New Hardware Support for National Instruments (NI) X Series Devices

Additional data acquisition hardware support was added as follows:

NI PCIe-6320	NI PCIe-6363
NI PCIe-6321	NI PXIe-6341
NI PCIe-6323	NI PXIe-6356
NI PCIe-6341	NI PXIe-6358
NI PCIe-6343	NI PXIe-6361
NI PCIe-6351	NI PXIe-6363
NI PCIe-6353	NI PXIe-6366
NI PCIe-6361	NI PXIe-6368

New Hardware Support for National Instruments (NI) Devices

Additional data acquisition hardware support was added as follows:

 NI USB-6212 (BNC)
 NI ENET-9206

 NI USB-6216 (BNC)
 NI ENET-9213

 NI USB-6218 (BNC)
 NI WLS-9205

NI USB-9213 NI WLS-9205 (DSUB)

NI ENET-9205 NI WLS-9206 NI ENET-9205 (DSUB) NI WLS-9213

New Hardware Support for Measurement Computing Corporation (MCC) Devices

Additional data acquisition support was added as follows:

MCC USB-1602HS MCC USB-1604HS-2AO

MCC USB-1602HS-2AO MCC PCIe-DIO24 MCC USB-1604HS MCC PCIe-DIO96H

New Hardware Support for NI-ELVIS II Devices

Data Acquisition Toolbox now supports the analog and digital I/O subsystems of the National Instruments Educational Laboratory Virtual Instrumentation Suite (ELVIS) II devices.

R2009b

Version: 2.15 New Features: Yes Bug Fixes: Yes

New Hardware Support for National Instruments (NI) Devices

Additional data acquisition hardware support was added as follows:

NI USB-4431	NI ENET-9421 (DSUB)
NI USB-4432	NI ENET-9472
NI USB-9263	NI ENET-9472 (DSUB)
NI USB-9264	NI ENET-9481
NI PCIe-6535	NI WLS-9421
NI PXIe-6535	NI WLS-9421 (DSUB)
NI PXIe-6536	NI WLS-9472
NI PXIe-6537	NI WLS-9472
NI ENET-9421	NI WLS-9481

New Hardware Support for Measurement Computing Corporation (MCC) Devices

Additional data acquisition support was added as follows:

MCC USB-3101FS MCC USB-1208HS-2AO

MCC USB-1208HS MCC USB-1208HS-4AO

New Version of InstaCal Driver Required

To use MCC devices with the Data Acquisition Toolbox software, install MCC InstaCal driver Version 5.89 or later.

Change in daqmem Output

Starting with Data Acquisition Toolbox Version 2.15, the dagmem function returns a MATLAB object instead of a structure. Although the properties of the object are identical to the fields within the structure, executing isstruct will return false.

R2009a

Version: 2.14 New Features: Yes Bug Fixes: Yes

New Hardware Support for National Instruments (NI) Devices

Additional data acquisition hardware support was added as follows:

NI USB-6259 (USB)

NI ENET-9219 (ENET)

NI USB-9234 (USB)

NI ENET-9234 (ENET)

NI PCI-6521 (PCI)

NI ENET-9237 (ENET)

NI PXI-6521 (PXI)

NI WLS-9211 (WLS)

NI PXIe-4496 (PXIe)

NI WLS-9215 (WLS)

NI PXIe-4498 (PXIe)

NI ENET-9211 (ENET) NI WLS-9219 (WLS)

NI PXIe-6124 (PXIe) NI WLS-9237 (WLS)

NI ENET-9215 (ENET)

New Hardware Support for Measurement Computing Corporation (MCC) Devices

Additional data acquisition support added for the MCC USB-DIO24H/37 device.

R2008b

Version: 2.13 New Features: Yes Bug Fixes: Yes

Keithley® and VXI Technology Adaptors Deprecated Compatibility Considerations: Yes

Keithley® and VXI Technology® adaptors will no longer work in the current release of the Data Acquisition Toolbox.

Compatibility Considerations

The change for this toolbox release is that you cannot create a Data Acquisition Toolbox object for the 'keithley' or 'hp1432' adaptors. You can get unsupported adaptors from the **Data Acquisition Adaptors** page in the File Exchange area on MATLAB Central.

Warning Added for Future Deprecation of National Instruments Traditional NI-DAQ Adaptor

You will see a warning when you create a Data Acquisition Toolbox object for devices that use the Traditional NI-DAQ driver. Support for devices using the Traditional NI-DAQ driver will be removed in a future release.

Notes NI-DAQmx drivers will continue to be supported. This change only affects Traditional NI-DAQ devices.

Warning Added for Future Deprecation of Parallel Port Adaptors

You will see a warning when you create a Data Acquisition Toolbox object for the 'parallel' device. The support for the 'parallel' device will be removed in a future release.

Data Acquisition Toolbox RTSI Bus Support

New support for synchronizing multiple National Instruments devices using a National Instruments RTSI bus.

New Hardware Support for National Instruments (NI) Devices

Additional data acquisition hardware support was added as follows:

NI PXI-6529 (PXI) NI USB-9219 (USB)

NI USB-6216 (USB) NI USB-9229 (BNC) (USB)

NI USB-6281 (USB) NI USB-9239 (USB)

NI USB-6281 (Mass Termination) (USB) NI USB-9239 (BNC) (USB)

NI USB-6289 (USB) NI SCXI-1112 (SCXI)

NI USB-6509 (USB)

New Hardware Support for Measurement Computing Corporation (MCC) Devices

Additional data acquisition support was added for the MCC USB-1616HS-BNC device.

Expanded Data Acquisition Toolbox Demos

Data Acquisition Toolbox product now has a new demo for synchronizing analog input and output using a RTSI bus.

R2008a

Version: 2.12 New Features: Yes Bug Fixes: Yes

Data Acquisition Toolbox Block Library

There are two new Simulink® blocks that can acquire or output a single point of analog data in a Simulink model.

- Analog Input (Single Sample) Acquire a single sample from multiple analog channels of a data acquisition device.
- Analog Output (Single Sample) Output a single sample to multiple analog channels of a data acquisition device.

New Hardware Support for National Instruments (NI) Devices

Additional data acquisition hardware support was added, as follows:

NI PXI-4496 (PXI)	NI SCXI-1102b (SCXI)
NI PXI-4498 (PXI)	NI SCXI-1102c (SCXI)
NI USB-6225 (USB)	NI SCXI-1104 (SCXI)
NI USB-6229 (USB)	NI SCXI-1104c (SCXI)
NI USB-6251 (USB)	NI SCXI-1120 (SCXI)
NI USB-6255 (USB)	NISCXI-1120d (SCXI)
NI USB-6259 (USB)	NI SCXI-1125 (SCXI)

New Hardware Support for Measurement Computing Corporation (MCC) Devices

Additional data acquisition hardware support was added, as follows:

MCC USB-1608HS MCC USB-1616HS-2

MCC USB-1608HS-2AO MCC USB-1616HS-4

MCC USB-1616HS MCC AI-EXP48

R2007b

Version: 2.11 New Features: Yes Bug Fixes: Yes

New Hardware Support for National Instruments (NI) Devices

Additional data acquisition hardware support was added, as follows:

NI USB-6221 (USB) NI PCI-6601 (PCI)

NI USB-6229 (USB) NI PCI-6602 (PCI)

NI PCIe-6536 (PCI Express®) NI PXI-6602 (PXI)

NI PCIe-6537 (PCI Express) NI PXI-6608 (PXI)

NI PCI-6255 (PCI)

Enhanced Performance of getsample and putsample Functions

The getsample and putsample functions perform faster when acquiring and sending a single data sample using NI-DAQmx driver software.

StandardSampleRates Property Defaults Changed

The default value of the ${\tt StandardSampleRates}$ property is changed from "on" to "off".

Upgrading from an Earlier Release

This section describes the issues involved in upgrading from Data Acquisition Toolbox Version 2.10 (Release 2007a) or earlier.

Obsolete dag Functions

Two functions with daq in their name are obsolete in Version 2.11 and are replaced with other functions. The toolbox will no longer support these obsolete functions and will display an error if you try to use them. If your code still uses these obsolete function names, you must update it to use the new function names.

Obsolete Function Name	New Function Name
daqaction	daqcallback
daqpropedit	inspect

Three Analog Properties Hidden Compatibility Considerations: Yes

The following three properties of analog input objects in the NI-DAQmx adaptor are now hidden:

- DriveAISenseToGround
- NumMuxBoards
- TransferMode

These properties are used only by Traditional NI-DAQ devices. If you have code that explicitly uses these properties it will continue to work, but code that puts the object's properties in a structure will no longer find these three properties. Tab completion for these three properties will no longer work.

Compatibility Considerations

In this release of the toolbox, the three properties <code>DriveAISenseToGround</code>, <code>NumMuxBoards</code>, and <code>TransferMode</code> are hidden for NI-DAQmx boards. You can, however, explicitly access these properties, but changing their values will not have any effect on NI-DAQmx boards.

R2007a

Version: 2.10 New Features: Yes Bug Fixes: Yes

New Hardware Support

Additional data acquisition hardware support was added, as follows:

- Support added for additional National Instruments (NI) data acquisition devices NI USB-6210 (USB); NI USB-6211 (USB); NI USB-6215 (USB); NI USB-6218 (USB); NI PCI-6230 (PCI); NI PCI-6232 (PCI); and NI PCI-6233 (PCI).
- Support added for additional Measurement Computing
 Corporation (MCC) data acquisition devices USB-3110; USB-3112;
 USB-3114; USB-3102; USB-3104; USB-3106; USB-3101; USB-3103;
 USB-3105; USB-2523; USB-2527; USB-2533; USB-2537; PCI-2511;
 PCI-2513; PCI-2515; and PCI-2517.

Note For the latest information about supported hardware, visit the Data Acquisition Toolbox product page at the MathWorks Web site www.mathworks.com/products/daq.

Time Series Support

Time series support has been added to the toolbox to enable easier analysis and visualization of time domain data in the MATLAB®. This functionality extends three Data Acquisition Toolbox functions, daqread, getdata, and putdata, to support the MATLAB timeseries and tscollection objects.

Warning Added for Future Deprecation of Keithley and VXI Technology Adaptors

Compatibility Considerations: Yes

Keithley and VXI Technology adaptors will be deprecated in a future version of the toolbox. If you create a Data Acquisition Toolbox object for the 'keithley' or 'hp1432' adaptors, you will receive a warning.

Compatibility Considerations

The change for this toolbox release is that you will see a warning if you create a Data Acquisition Toolbox object for the 'keithley' or 'hp1432' adaptors. The warning is being introduced now, but the adaptors will continue to be supported and will be removed in a future release.

R2006b

Version: 2.9 New Features: Yes Bug Fixes: Yes

Data Acquisition Toolbox Block Library

You can use these blocks to acquire analog or digital data in a Simulink model, or to output analog or digital data from the model to a hardware device. The toolbox block library contains four blocks:

- **Analog Input** Acquire data from multiple channels of an analog data acquisition device.
- **Analog Output** Output data to multiple channels of an analog data acquisition device.
- **Digital Input** Acquire the latest set of values from multiple lines of a digital data acquisition device.
- **Digital Output** Output data to multiple lines of a digital data acquisition device.

New Hardware Support

Additional data acquisition hardware support was added, as follows:

- Support added for four additional National Instruments (NI) data acquisition devices NI USB-6251 (USB); NI USB-6259 (USB); NI PCIe-6251 (PCI Express); and NI PCIe-6259 (PCI Express).
- Support added for an additional Measurement Computing Corporation (MCC) data acquisition device MCC USB-1408FS (USB).

Note For the latest information about supported hardware, visit the Data Acquisition Toolbox product page at the MathWorks Web site www.mathworks.com/products/dag.

Corrected Spelling of InputType Value Pseudodifferential

Compatibility Considerations: Yes

Analog input objects have a number of acceptable values for their InputType property: NonReferencedSingleEnded, SingleEnded, Differential, and Pseudodifferential. In the initial release of the NI-DAQmx adaptor in Version 2.8 (R14SP3+), Pseudodifferential was incorrectly spelled as Psuedodifferential. The toolbox change now correctly spells this input type as Pseudodifferential.

Compatibility Considerations

This change is backward compatible; users that saved analog input objects with the InputType property set to the misspelled Psuedodifferential will be able to load the object in R2006b and later with no changes on their part. The compatibility issue is that if you save an analog input object with this InputType value in R2006b, you will not be able to share it with users of R2006a and earlier versions. Analog input objects that have their InputType set to Pseudodifferential will be unusable in R2006a and previous releases. Analog input objects that use the other InputType values are unaffected.

If you use the set function to assign the incorrectly spelled value Psuedodifferential, in Version 2.9 (R2006b), you will get a warning and it will be changed to the correct spelling. In the following release of the toolbox, you will get an error advising you to use the new spelling. The get function will always return the correctly spelled value.

R2006a

Version: 2.8.1 New Features: No Bug Fixes: Yes

R14SP3+

Version: 2.8

New Features: Yes Bug Fixes: Yes

NI-DAQmx Support

The Data Acquisition Toolboxtm_dataacquisitiontoolbox; software supports National Instruments hardware that uses the NI-DAQmx software interface.

The adaptor name in the Data Acquisition Toolbox software is nidaq, which can be used in all syntax requiring the adaptor name.

To display your installed hardware that can be accessed using the NI-DAQmx adaptor, type

```
daghwinfo('nidag')
```

daqhwinfo returns information about the hardware that is installed, and the IDs that the National Instruments Measurement & Automation Explorer has assigned to these devices. Typically, these IDs start with the letters Dev followed by a number.

The toolbox supports both Traditional NI-DAQ and NI-DAQmx. For information about choosing which driver to use, see in "Troubleshooting Your Hardware" of the Data Acquisition Toolbox User's Guide.

Upgrading from an Earlier Release

This section details the issues to be aware of when upgrading from Data Acquisition Toolbox Version 2.7 to Version 2.8.

DriveAlSenseToGround Property

The DriveAISenseToGround property is ignored by National Instruments devices. For information on configuring AI referencing properties, see the reference page for the InputType property.

R14SP3

Version: 2.7 New Features: No Bug Fixes: Yes

R14SP2

Version: 2.6

New Features: Yes Bug Fixes: Yes

New Functions: islogging, isrunning, and issending

Three new functions are provided to query the status of data acquisition device objects.

Function	Purpose
islogging	Determine whether analog input object is logging data.
isrunning	Determine whether device object is running.
issending	Determine whether analog output object is sending data.

For further details on each function, see its reference page in the documentation. Use of these functions is recommended over directly accessing the Running, Logging, and Sending properties.

Using PFI or RTSI Channels for Triggers and Clocks

Three new properties for National Instruments cards are:

- HwDigitalTriggerSource
- ExternalSampleClockSource
- ExternalScanClockSource

These properties allow you to select a PFI or RTSI channel as the source for a hardware digital trigger, external sample clock, or external scan clock. See the reference pages for these properties to read about valid property settings and when they are in effect.

peekdata Allows Type Parameter

The peekdata function now accepts a third parameter specifying data format. When the data format is specified as native, data is returned in the native format of the data acquisition device, similar to the behavior of the getdata function. For detailed information on peekdata, type

help analoginput/peekdata

Property Inspector Replaces dagpropedit

The Property Inspector replaces the Data Acquisition Toolbox Property Editor (daqpropedit) graphical user interface.

You open the Property Inspector for object obj with the inspect function.

inspect(obj)

For more information about the inspect function, type

help daqdevice/inspect

Typing dagpropedit at the command line now opens the Property Inspector.

waittilstop Function Renamed wait

The waittilstop function has been renamed wait. All functionality remains the same. waittilstop still works in Version 2.6, but may be removed from a future version of the toolbox. For more information on wait, type

help daqdevice/wait

Upgrading from an Earlier Release

This section describes the issues involved in upgrading from Data Acquisition Toolbox Version 2.5.1 (Release 14SP1), 2.5 (Release 14), or 2.2 (Release 13SP1).

Obsolete Action Properties

All object properties with Action in their name are obsolete in Version 2.6. These have been replaced by properties with the same name using Fcn instead of Action. These Fcn properties have existed in several recent versions of the Data Acquisition Toolbox software. The toolbox supported the Action properties during these transition releases, but they are no longer supported. If your code still uses these obsolete property names, you must update it to use the new property names.

Obsolete Property Name	New Property Name
DataMissedAction	DataMissedFcn
InputOverRangeAction	InputOverRangeFcn
RuntimeErrorAction	RuntimeErrorFcn
SamplesAcquiredAction	SamplesAcquiredFcn
SamplesAcquiredActionCount	SamplesAcquiredFcnCount
SamplesOutputAction	SamplesOutputFcn
SamplesOutputActionCount	SamplesOutputFcnCount
StartAction	StartFcn
StopAction	StopFcn
TimerAction	TimerFcn
TriggerAction	TriggerFcn

Deleting a Running Object

In past releases, you could not delete a running object. Now in Version 2.6, when you attempt to delete a running object, the toolbox stops the object, issues a warning, then deletes the object.

```
ai.SamplesPerTrigger = Inf
start(ai);
delete(ai)
Warning: Object stopped before deleting.
```

Return Format of dagfind

In past versions, the daqfind function returned a 1-by-1 cell array of N-by-1 objects. Now in Version 2.6, this function returns an N-by-1 cell array of objects.

```
ai1 = analoginput('winsound');
ai2 = analoginput('winsound');
objs = daqfind('Type','Analog Input')
objs =
    [1x1 analoginput]
    [1x1 analoginput]
```

peekdata and getdata Number of Samples

The functions peekdata and getdata no longer accept Inf as an argument for specifying the number of samples. In the past, specifying Inf for the number of samples was accepted, and returned zero samples. Now specifying Inf samples causes an error.

```
data = getdata(ai, Inf)
??? The number of samples requested must be less than Inf.
```

waittilstop Function Renamed wait

The waittilstop function has been renamed wait. All functionality remains the same. waittilstop still works in Version 2.6, but may be removed from a future version of the toolbox. For more information on wait, type

```
help daqdevice/wait
```

dapropedit Replaced by inspect

The Data Acquisition Toolboxtm_dataacquisitiontoolbox; Property Editor (daqpropedit) graphical user interface has been replaced by the Property Inspector.

You open the Property Inspector for object obj with the inspect function.

inspect(obj)

For more information about the inspect function, type

help daqdevice/inspect

Typing daqpropedit at the command line now opens the Property Inspector.