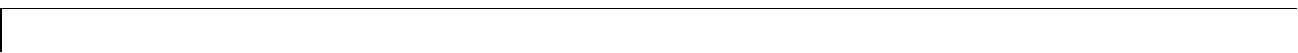# Data Acquisition Toolbox Release Notes

"Data Acquisition Toolbox 2.8 Release Notes" on page 1-1 describes the changes introduced in the latest version of the Data Acquisition Toolbox. The following topics are discussed in these Release Notes.

- "New Features and Enhancements" on page 1-2
- "Major Bug Fixes" on page 1-3
- "Upgrading from an Earlier Release" on page 1-4
- "Known Software and Documentation Problems" on page 1-5
- "Vendor Limitations" on page 1-6

The Data Acquisition Toolbox Release Notes also provide information about recent versions of the product, in case you are upgrading from a version that was released prior to Release 14SP2.

- "Data Acquisition Toolbox 2.7 Release Notes" on page 2-1
- "Data Acquisition Toolbox 2.6 Release Notes" on page 3-1
- "Data Acquisition Toolbox 2.5.1 Release Notes" on page 4-1
- "Data Acquisition Toolbox 2.5 Release Notes" on page 5-1

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Data Acquisition Toolbox 2.8 Release Notes

New Features and Enhancements

This section summarizes the new features and enhancements introduced in the Data Acquisition Toolbox 2.8.

NI-DAQmx Support

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

The adaptor name in the Data Acquisition Toolbox 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

```
daqhwinfo('nidaq')
```

`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 the "National Instruments Hardware" section in the "Troubleshooting Your Hardware" appendix of the Data Acquisition Toolbox User's Guide.

Major Bug Fixes

To view major bug fixes made in R14SP3+ for the Data Acquisition Toolbox, use the Bug Reports interface on the MathWorks Web site. The report is sorted with fixed bugs listed first, and then open bugs.

Note If you are not already logged in to Access Login, when you link to the Bug Reports interface, you will be prompted to log in or create an Access Login account.

If you are upgrading from a release earlier than Release 14SP3, see Version 2.7 "Major Bug Fixes" on page 2-2.

Upgrading from an Earlier Release

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

If you are upgrading from a release earlier than Version 2.7, also see "Upgrading from an Earlier Release" on page 2-3.

DriveAISenseToGround 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.

Known Software and Documentation Problems

To view important open bugs in R14SP3+ for Data Acquisition Toolbox, use the Bug Reports interface on the MathWorks Web site. The report is sorted with fixed bugs listed first, and then open bugs. You can select the **Status** column to list the open bugs first.

Note If you are not already logged in to Access Login, when you link to the Bug Reports interface, you will be prompted to log in or create an Access Login account.

Vendor Limitations

This section describes specific limitations of the Data Acquisition Toolbox particular to each vendor:

- "Keithley Hardware" on page 1-6
- "National Instruments Hardware" on page 1-8
- "Measurement Computing Hardware" on page 1-9
- "Agilent Technologies Hardware" on page 1-9
- "Windows Sound Cards" on page 1-10

Keithley Hardware

Known problems associated with Keithley hardware are described below. If there is a known resolution, then it is described as well.

Problem	Boards	Comments
Data missed event on output	KCPI-1801/02 KPCI-3110	For high sample rates and large numbers of samples, these boards may drop samples on output. To avoid this problem, try increasing the default `BufferingConfig` property value.
No output at maximum sampling rate	KPCI-3110	When the sampling rate is set above 600 kHz, the output is corrupted.
Cannot sample properly below 10 Hz	KPCI-3110	For sample rates at or below approximately 10 Hz, the acquisition takes longer than expected. For example, a 1-second acquisition at 10 Hz takes approximately 3 seconds. This is due to a limitation in the number of blocks that the hardware device can transfer at a time. To avoid this problem, use software clocking.

Problem	Boards	Comments
Time out on output	Software clocked devices	Some software clocked devices may time out when outputting data. This is due to a limitation in the number of blocks that the hardware devices can transfer at a time.
Queuing data while running	KPCI-1801/02HC KPCI-3110	If an analog output object is running and more data is queued, then no data is output. To avoid this problem, try increasing the default `BufferingConfig` property value.
Digital triggers are not available.	All	Digital triggers are not available if supported in interrupt mode. This applies to both start and stop triggers. Digital triggers are available only if supported in direct memory access (DMA) mode.
Limited channel skew values	PCMCIA boards	These boards support only these specific channel skew values: 10 µs, 20 µs, 40 µs.
SS/H is not supported for analog output.	PCMCIA boards, DDA-08, DDA-16	The analog output subsystems for these boards have simultaneous sample and hold (SS/H) capabilities. However, the toolbox does not support this feature.
Repeating triggers may result in dropped samples.	All	If the `TriggerRepeat` property is nonzero, samples may be dropped during acquisition. To avoid this problem, configure the `BufferingConfig` property to an exact multiple of the `SamplesPerTrigger` property.
Analog input subsystem is not available.	KPCMCIA-16AIAO	N/A

National Instruments Hardware

- The Data Acquisition Toolbox requires Version 7.5 of the NI-DAQmx drivers.

- If you use the Data Acquisition Toolbox and National Instruments' Measurement and Automation (M&A) Explorer at the same time, a conflict will occur and you will not be able to access your board. To avoid a conflict, you should access your board using either the toolbox or the M&A Explorer, and close the other software application.

- If you install NI-DAQ on your computer, and then install LabVIEW 6i on the same computer, you will need to reinstall NI-DAQ.

- When running a device with a Traditional NI-DAQ driver at a sampling rate of 5000 Hz or higher and with a `TransferMode` property value of `Interrupt`, system performance might decline.

- You should configure the `SampleRate` property with the `setverify` function just before starting the hardware. Note that the `SampleRate` value depends on the number of channels added to the device object, and the `ChannelSkew` property value depends on the `SampleRate` value.

- When using the 1200 series hardware, you must add channels in reverse order. If you specify invalid channels, the data acquisition engine will create the number of requested channels with valid hardware IDs. You can determine the hardware IDs with the object's display or with the `HwChannel` property.

- Only one digital I/O (DIO) object should be associated with a given DIO subsystem. To perform separate tasks with the hardware lines, you should add all the necessary lines to the DIO object, but partition them into separate line groups based on the task.

- When using a Traditional NI-DAQ driver, all channels contained within an analog input object must have the same polarity. In other words, the `InputRange` property for these channels must have all unipolar values or all bipolar values.

- When using mux boards, you must add channels in a specific order using the `addmuxchannel` function.

- If you have trouble acquiring data with the DAQPad-MIO-16XE-50, you should increase the size of the engine buffer with the `BufferingConfig` property.

Measurement Computing Hardware

- For boards that do not have a channel gain list, an error occurs at `start` if all the channel input ranges are not the same or the channel scan order is not contiguous. However, if the `ClockSource` property value is set to `software`, this rule does not apply.

- You should configure the `SampleRate` property with the `setverify` function just before starting the hardware. Note that the `SampleRate` value is dependent upon the number of channels added to the device object.

- For boards that do not support continuous background transfer mode (i.e., the board does not have hardware clocking), the only available `ClockSource` property value is `software`.

- When running at a sampling rate of 5000 Hz or higher and with a `TransferMode` property value of `InterruptPerPoint`, there may be a considerable decline in system performance.

- Most boards do not support simultaneous input and output. However, if software clocking is used, then this limitation does not apply.

- To use hardware digital triggers with the PCI-DAS4020/12 board, you must first configure the appropriate trigger mode with InstaCal.

- Expansion boards are not supported. This includes the CIO-EXP family of products.

- MEGA-FIFO hardware is not supported.

Agilent Technologies Hardware

- When you start an analog input object associated with an E1432A or E1433A board that has the Arbitrary Source Output option, the source is automatically started. Therefore, you should not use a `TriggerType` property value of `Manual` with hardware having this option.

- For analog output objects, you should configure the `SampleRate` and `Span` properties with the `setverify` function just before starting the hardware, since these property values depend on the number of channels contained by the analog output object.

- You must add channels in increasing order and a channel array cannot contain repeated channels.

- The first time you connect a device object to an Agilent board, a list of available hardware is determined and all the hardware is initialized. However, this list is not updated during a MATLAB session. Therefore, if you install a new board or remove an existing board while MATLAB is running, you will not see the new configuration. To see the new configuration, you must restart MATLAB. When all device objects are deleted from the data acquisition engine, all the hardware is closed.

- For the E1433A, the minimum sampling rate is 20 Hz and the minimum span is 7.8125.

- The first channel in the `TriggerChannel` property list is used to trigger the object.

- For the E1434A, channels 1 and 2 and channels 3 and 4 share a 56000 DSP. Therefore, certain operational aspects are coupled between the channels in each pair. For example, both channels in each pair will have the same `RampRate` property value.

- If you create a device object that spans multiple boards, the device object should list the logical addresses using the same order as returned by the `daqhwinfo` function. To determine the logical address order, use the `daqhwinfo` function with no input arguments and examine the `InstalledBoardIds` field.

Windows Sound Cards

- The maximum sampling rate depends on the `StandardSampleRates` property value. If `StandardSampleRates` is `On`, the maximum `SampleRate` property value is 44100. If `StandardSampleRates` is `Off`, the maximum `SampleRate` property value is 96000 if supported by the sound card.

  For some sound cards that allow nonstandard sampling rates, certain values above 67,000 Hz will cause your computer to hang.

- If you are acquiring data when `StandardSampleRates` is `Off`, one of these messages may be returned to the command line depending on the specific sound card you are using:

  - `"Invalid format for device winsound"` occurs when the sound card does not allow for any nonstandard value.

  - `"Device Winsound already in use"` occurs when a nonstandard sampling rate is specified and the device takes longer than expected to acquire data.

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Data Acquisition Toolbox 2.7 Release Notes

Major Bug Fixes

To view major bug fixes made in R14SP3 for the Data Acquisition Toolbox, use the Bug Reports interface on the MathWorks Web site. The report is sorted with fixed bugs listed first, and then open bugs.

Note If you are not already logged in to Access Login, when you link to the Bug Reports interface, you will be prompted to log in or create an Access Login account.

If you are upgrading from a release earlier than Release 14SP2, you should also see Version 2.6 "Major Bug Fixes" on page 3-4.

Upgrading from an Earlier Release

There are no issues involved in upgrading from the Data Acquisition Toolbox 2.6 to Version 2.7.

If you are upgrading from a release earlier than Version 2.6, also see "Upgrading from an Earlier Release" on page 3-5.

3

Data Acquisition Toolbox 2.6 Release Notes

New Features

This section summarizes the new features and enhancements introduced in the Data Acquisition Toolbox 2.6.

New Functions: islogging, isrunning, issending

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

Function	Purpose
islogging	Determine if analog input object is logging data.
isrunning	Determine if device object is running.
issending	Determine if 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

- HwDigitalTriggerSoruce
- 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 daqpropedit

The Property Inspector replaces the Data Acquisition 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 `daqpropedit` 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
```

Major Bug Fixes

To view major bug fixes made in R14SP2 for the Data Acquisition Toolbox, use the Bug Reports interface on the MathWorks Web site. The report is sorted with fixed bugs listed first, and then open bugs.

Note If you are not already logged in to Access Login, when you link to the Bug Reports interface, you will be prompted to log in or create an Access Login account.

If you are upgrading from a release earlier than Release 14SP1, you should also see Version 2.5.1 "Major Bug Fixes" on page 4-2.

Upgrading from an Earlier Release

This section describes the issues involved in upgrading from the Data Acquisition Toolbox 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. 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 daqfind

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
```

daqpropedit Replaced by inspect

The Data Acquisition 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.

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Data Acquisition Toolbox 2.5.1 Release Notes

Major Bug Fixes

The Data Acquistion Toolbox 2.5.1 includes several bug fixes made since Version 2.5. You can see a list of the particularly important Version 2.5.1 bug fixes.

If you are viewing these Release Notes in PDF form, please refer to the HTML form of the Release Notes, using either the Help browser or the MathWorks Web site and use the link provided.

If you are upgrading from a release earlier than Release 14, then you should also see Version 2.5 "Major Bug Fixes" on page 5-2.

Upgrading from an Earlier Release

There are no upgrade issues involved upgrading from the Data Acquisition Toolbox 2.5 (Release 14).

There are no upgrade issues involved upgrading from the Data Acquisition Toolbox 2.2 (Release 13 with Service Pack 1).

Data Acquisition Toolbox 2.5 Release Notes

Major Bug Fixes

The Data Acquistion Toolbox 2.5 includes several bug fixes made since Version 2.2. You can see a list of the particularly important Version 2.5 bug fixes.

If you are viewing these Release Notes in PDF form, please refer to the HTML form of the Release Notes, using either the Help browser or the MathWorks Web site and use the link provided.

Upgrading from an Earlier Release

There are no upgrade issues involved upgrading from the Data Acquisition Toolbox 2.2 (Release 13 with Service Pack 1).