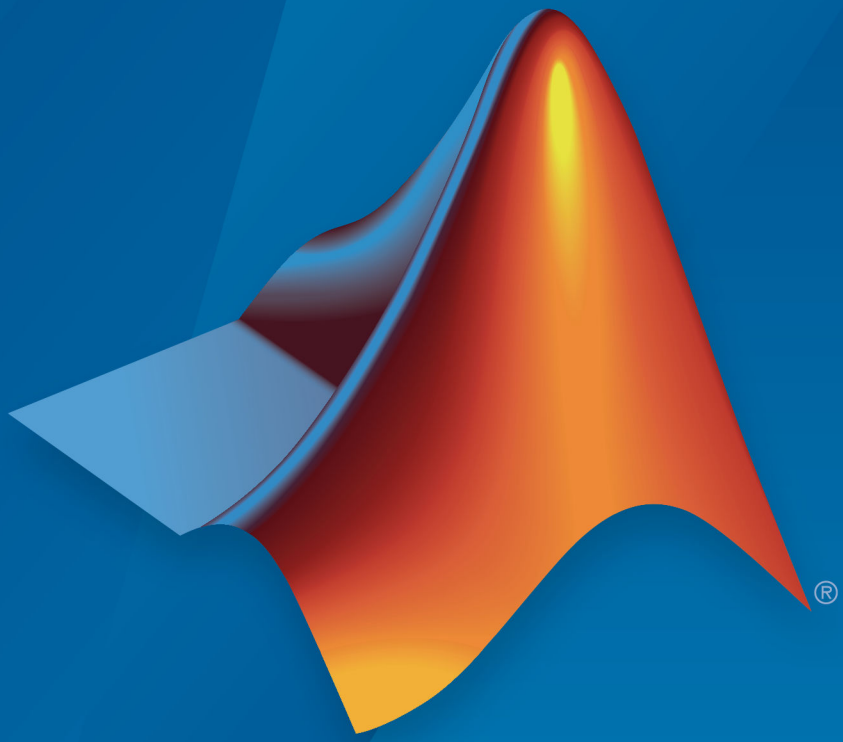
Data Acquisition Toolbox™ Release Notes



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Data Acquisition Toolbox™ Release Notes

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Version: 3.14

New Features

Bug Fixes

National Instruments Support: Connect to additional National Instruments devices

This release of Data Acquisition Toolbox provides new support for the following National Instruments® devices.

9210
9215
9224
9251

For a full list of hardware supported by Data Acquisition Toolbox, see `Hardware Support`.

Measurement Computing Support: Connect to additional Measurement Computing devices

This release of Data Acquisition Toolbox provides new support for the following Measurement Computing™ devices.

USB-204
USB-1808X

Note: Analog output streaming is not supported on the USB-1808X.

For a full list of hardware supported by Data Acquisition Toolbox, see `Hardware Support`.

Digilent Analog Discovery 2 Support: Acquire data and generate signals with Digilent Analog Discovery 2 hardware

Data Acquisition Toolbox Support Package for Digilent® Analog Discovery™ Hardware now supports Digilent Analog Discovery 2 devices.

For a list of supported Digilent Analog Discovery devices, see Digilent Analog Discovery Support from MATLAB.

For information on installing support packages for particular vendors, see “Data Acquisition Toolbox Supported Hardware”.

Improved Single Scan Performance for National Instruments Devices

This release provides significantly reduced latency in `inputSingleScan` and `outputSingleScan` for National Instruments devices.

R2018a

Data Acquisition SDK: Add digital I/O support to custom adaptors that interface to third-party vendors and devices

This release provides support for digital input and output channels in custom adaptors built with the Data Acquisition Toolbox SDK. You can create adaptors that include single scan and streaming digital input/output.

For more information on the demo adaptor and creating a custom adaptor, see Build Custom Adaptors.

Digital I/O Channels

The following updates to the SDK allow you to define digital I/O channels:

- The demo adaptor source code includes the following new functions:

  ```
  DemoAdaptor::initAdaptorImpl
  DemoDriver::getDigitalChannelTypesImpl
  DemoDriver::getChannelDirectionImpl
  DemoDriver::setChannelDirectionImpl
  ```

  There are corresponding `VendorAdaptor` and `VendorDriver` versions in the templates for the vendor driver. For more information, see Adaptor API Reference.
- The `custom_demo` source files include the following new macro:

  ```
  GETADAPTOR
  ```

  The `GETADAPTOR` macro should be used instead of calls to the function `AdaptorFactory::getAdaptor()`.

Digital I/O Streaming

The following SDK updates accommodate digital streaming:

- The following two new C++ file templates are provided in *`matlabroot`*`/toolbox/daq/daqsdk/src/daqadaptor/DemoAdaptor` and *`matlabroot`*`/toolbox/daq/daqsdk/src/daqadaptor/VendorAdaptor`:

  ```
  daqstream_digital.cpp
  daqstream_digital.hpp
  ```

  See Demo Adaptor Description.

- To be consistent with the `daqstream_digital` code, the `daqstream_analog` source files include the following new function:

  `makeStream`

  For more information, see Streaming Input and Output and Streaming API Reference.

Compatibility Considerations

Adaptor MEX-files that were built in versions R2017a and R2017b should work in this release. Adaptor MEX-files built in this R2018a release should work in R2017a and R2017b, but only for support of analog input and output.

Source code that was used to create adaptors in earlier releases needs to be modified as follows before you can build an adaptor in R2018a:

- Your adaptor code must include definitions for the new functions described above. You can copy and paste these into your source file, defining them as you did for other unused functions. It is recommended that you compare the source file templates from the new and old releases to identify the additional functions.
- Custom function calls to `AdaptorFactory::getAdaptor()` should be replaced by calls to the `GETADAPTOR` macro.

R2017b

Version: 3.12

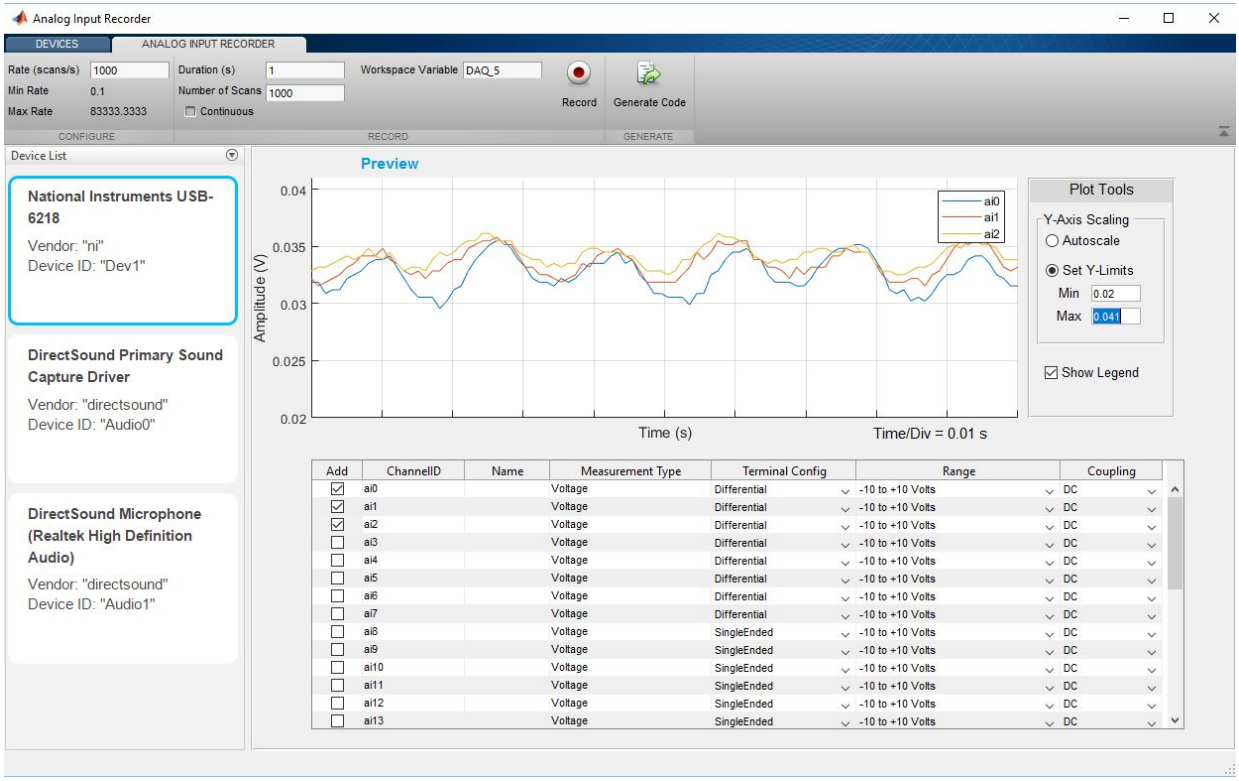
New Features

Bug Fixes

Analog Input Recorder App: Acquire and visualize analog input signals

The Data Acquisition Toolbox **Analog Input Recorder** app provides a graphical interface for configuring data acquisition devices, previewing their signals, and recording analog input signals. In this release the app supports National Instruments, Analog Devices, and DirectSound devices.

Plug in your device, open the app, and you are ready to start viewing and recording data. For more information, see Acquire Data with the Analog Input Recorder.



Hardware Support: Connect to additional National Instruments devices

R2017b supports the National Instruments NI cDAQ-9179 CompactDAQ chassis.

For a full list of supported hardware for the Data Acquisition Toolbox, see `Hardware Support`.

Hardware Support: Connect to additional Measurement Computing DAQ devices

Data Acquisition Toolbox provides new or enhanced support for the following Measurement Computing data acquisition devices in this release.

New Support	Enhanced Support

`PCI-DAC6703`
`USB-1208HS-4AO`
`USB-1604HS-2AO`
`USB-1616FS`
`USB-2404-10`
`USB-3101FS`
	`USB-1208FS-Plus`
	`USB-1408FS-Plus`
	
	Analog output streaming operations now supported for these devices.

For a full list of supported hardware for the Data Acquisition Toolbox, see `Hardware Support`.

R2017a

Version: 3.11

New Features

Bug Fixes

Data Acquisition SDK: Create custom adaptors to extend toolbox capabilities to third-party vendors and devices

You can now create your own adaptors to access third-party devices in Data Acquisition Toolbox. For more information on the SDK, see Build Custom Adaptors.

Measurement Computing Support: Acquire data from Measurement Computing data acquisition hardware

Data Acquisition Toolbox now supports Measurement Computing devices for analog input and analog output voltage operations. Among the devices now supported are the following:

```
USB-1208LS
USB-1208FS-Plus *
USB 1408FS-Plus *
USB-1608FS
USB-1608FS-PLUS
USB-1608GX-2AO
USB-1616HS-4
```

```
USB-2020
USB-205
USB-234
USB-2537
USB-2637
PCI-DAS6035
PCI-DAS6071
PCI-DAS6052
```

* Analog output (AO) streaming not supported.

For a complete and up-to-date list of supported MCC devices, see Measurement Computing DAQ Support from Data Acquisition Toolbox.

For information on installing support packages for particular vendors, see Data Acquisition Toolbox Supported Hardware.

R2016b

Simulink Blocks: Acquire and generate data in Simulink models using National Instruments, Analog Devices, and Digilent hardware

The following blocks are new in the Data Acquisition Toolbox block library for support of 64-bit MATLAB®:

- Analog Input
- Analog Output
- Analog Input (Single Sample)
- Analog Output (Single Sample)
- Digital Input (Single Sample)
- Digital Output (Single Sample)

Compatibility Considerations

In releases prior to R2016a, some of the blocks in the Data Acquisition Toolbox had the same names as these new blocks. If you open a model containing these old blocks, the model will either fail to find some blocks, or report errors for others. You must remove these old blocks from your model and replace them with new blocks from the current library.

Hardware Support: Connect to additional National Instruments DAQ devices

In R2016b, the following additional National Instruments DAQ devices are supported.

CompactDAQ Controllers	C Series Devices	X Series Devices	Dynamic Signal Acquisition Devices	SC Express Devices
cDAQ-9132/34 cDAQ-9133/35	NI 9230 (BNC) NI 9232 (BNC) NI 9251 NI 9436	PXIe-6378 PXIe-6345 PXIe-6355 PXIe-6365 PXIe-6375	PXIe-4464	PXIe-4339

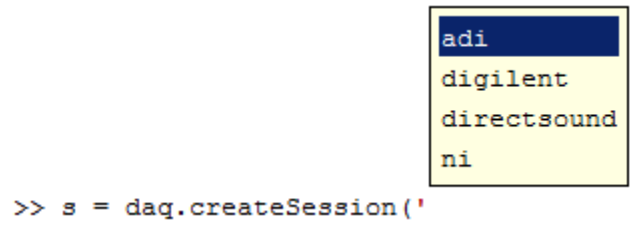
For a full list of supported hardware for the Data Acquisition Toolbox, see `Hardware Support`.

Advanced tab completion for functions

To get a list of options that you can use at a certain location in a function call, press **Tab** after entering the function name on the command line. The list of valid options appears and you can scroll to choose an argument. For example, when you create a session with `daq.createSession`, you can get a list of supported vendors. Type the following:

```
s = daq.createSession(
```

When you press **Tab** after the left parentheses, the list of vendors appears:.



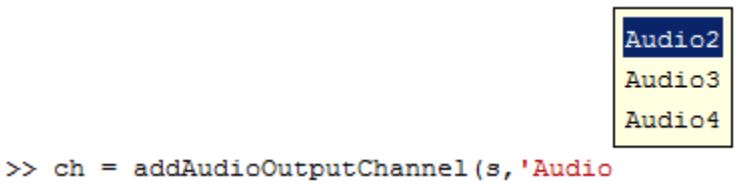
Double-click the name of the vender you want to insert, then complete the line.

```
s = daq.createSession('directsound')
```

To continue with a session channel on a device, use tab completion with the `addAudioOutputChannel` function to get a list of devices. Type the following:

```
ch = addAudioOutputChannel(s,
```

Then press **Tab**:



Double-click your choice again. Continue until the line is complete:

```
>> ch = addAudioOutputChannel(s,'Audio3','2')
```

You can use this technique to construct any toolbox function call where the input at the specific location is limited to a choice of defined character vectors.

R2016a

Hardware Support: Measure and source voltage and current from Analog Devices ADALM1000 hardware

Data Acquisition Toolbox provides a support package for the Analog Devices® ADALM1000 source-measurement unit (SMU). To install the support package from MATLAB, in the Home tab click **Add-Ons > Get Hardware Support Packages**. For more information on support package availability and installation, see Supported Hardware.

Legacy interface removed

The Data Acquisition Toolbox legacy interface has been removed. Only the session-based interface is supported on 64-bit Windows® architectures.

Compatibility Considerations

Interface Code

Legacy interface code now generates an error. For this release, you must update legacy code to use the session-based interface. The following table shows a small sample of legacy vs. session interface code.

Legacy code	Session code

`ai = analoginput('nidaq','Dev1');`
`addchannel(ai,0);`
`start(ai);`
`data = getdata(ai);`
	`s = daq.createSession('ni');`
	`addAnalogInputChannel(s,'Dev1',1,'voltage')'`
	
	`data = startForeground(s);`

For more information about updating your code to the session interface, see Transition Your Code to Session-Based Interface.

Simulink Blocks

With the removal of the legacy interface, there are no Simulink® blocks provided by Data Acquisition Toolbox in this release.

32-bit drivers no longer supported

In R2016a, 32-bit MATLAB is no longer supported, therefore 32-bit device drivers are no longer supported in this release.

Compatibility Considerations

With the removal of 32-bit driver support, the only vendors supported by Data Acquisition Toolbox are Digilent, National Instruments, DirectSound, and Analog Devices, as shown in the output of the `daq.getVendors` function:

```
daq.getVendors
```

```
Number of vendors: 4
Analog
            Devices
index     ID      Operational         Comment
----- ----------- ----------- ------------------------
1     ni          true        National Instruments
2     digilent    true        Digilent Inc.
3     adi         true        Analog Devices Inc.
4     directsound true        DirectSound
```

Functionality being removed or changed

Functionality	Result	Use Instead	Compatibility Considerations
`addchannel`	Error	`daq.createSession`, `addAnalogInputChannel`, `addAnalogOutputChannel`	Analog input and analog output objects removed. Use the session interface instead.
`addline`	Error	`daq.createSession`, `addDigitalChannel`	Digital IO object removed. Use the session interface instead.
`addmuxchannel`	Error	Not applicable	Analog input object removed.

Functionality	Result	Use Instead	Compatibility Considerations
`analoginput`, `analogoutput`	Error	`daq.createSession`, `addAnalogInputChannel`, `addAnalogOutputChannel`	Analog input and analog output objects removed. Their properties and methods are no longer available. Use the session interface instead, as described in Transition Your Code to Session-Based Interface.
`daqcallback`	Error	`addlistener`	Background operations use listeners to monitor events.
`daqfind`	Error	`daq.getVendors`	Use the session interface instead.
`daqhwinfo`	Error	`daq.getDevices`	Use the session interface instead.
`daqmem`	Error	`memory`	Use MATLAB memory monitoring.
`daqregister`	Error	Not applicable	No longer required.
`digitalio`	Error	`daq.createSession`, `addDigitalChannel`	Digital IO object removed. Its properties and methods are no longer available. Use session interface instead, as described in Transition Your Code to Session-Based Interface.
`flushdata`	Error	Not applicable	No longer required.

Functionality	Result	Use Instead	Compatibility Considerations
`getdata`	Error	`startForeground`, `startBackground`, `DataAvailable`	Use the session interface instead.
`getsample`, `getvalue`	Error	`inputSingleScan`	Use the session interface instead.
`ischannel`, `isdioline`, `islogging`, `isrunning`, `issending`, `isvalid`	Error	Not applicable	Legacy objects not supported.
`load`	Error	Not applicable	Legacy objects not supported.
`makenames`	Error	Not applicable	No replacement
`muxchanidx`	Error	Not applicable	No replacement
`obj2mfile`	Error	Not applicable	No replacement
`peekdata`	Error	Not applicable	No replacement
`propinfo`	Error	Not applicable	No replacement
`putdata`	Error	`startForeground`, `startBackground`, `DataRequired`	Use the session interface instead.
`putsample`, `putvalue`	Error	`outputSingleScan`	Use the session interface instead.
`save`	Error	Not applicable	Legacy objects not supported.
`setverify`	Error	Not applicable	No replacement
`showdaqevents`	Error	Not applicable	No replacement
`softscope`	Error	Not applicable	Softscope removed.
`start`	Error	`startForeground`, `startBackground`	Use the session interface instead.

Functionality	Result	Use Instead	Compatibility Considerations
`trigger`	Error	`addTriggerConnection`	Use the session interface instead.
Analog Input block	Unresolved link in model	Not applicable	Block library removed.
Analog Output block	Unresolved link in model	Not applicable	Block library removed.
Analog Input (Single Sample) block	Unresolved link in model	Not applicable	Block library removed.
Analog Output (Single Sample) block	Unresolved link in model	Not applicable	Block library removed.
Digital Input block	Unresolved link in model	Not applicable	Block library removed.
Digital Output block	Unresolved link in model	Not applicable	Block library removed.
32-bit driver support	Error	64-bit driver	Use 64-bit drivers.

R2015b

Support for additional National Instruments DAQ devices

In R2015b, the following additional National Instruments DAQ devices are supported.

- NI 9242 and 9244 C Series devices
- NI 9212, 9218, 9238, and 9437 C Series devices
- NI 6345, 6355, 6365, and 6375 X Series devices
- NI PXIe-4463 Dynamic Signal Acquisition device
- NI 9209, 9216/26, 9246/47, 9230, and 9344 C Series devices

For a full list of supported hardware for the Data Acquisition Toolbox, see `Hardware Support`.

Removal of 32-bit MATLAB and the legacy interface

Starting in R2016a, 32-bit MATLAB will no longer be supported. For Data Acquisition Toolbox, that means starting in R2016a, the legacy interface will no longer be supported.

In R2015b, you will receive a warning that the legacy interface will be unavailable in the following release. In R2016a, you will receive errors if you try to use it.

Note that the session-based interface is supported on 64-bit Windows. It is recommended that you transition to that interface.

Compatibility Considerations

Since 32-bit MATLAB will no longer be supported starting in R2016a, the legacy interface will no longer be available at that point. In this release, you will receive the following warning when you use the legacy interface.

```
Warning: Legacy interface will no longer be available starting
in MATLAB R2016a. Consider transitioning your code to session-based
interface. If you are unable to find information on transitioning your
code because you are using hardware not supported in the session-based
interface, contact MathWorks technical support.
```

For more information about switching to the session interface, see Transition Your Code to Session-Based Interface.

R2015a

Version: 3.7

New Features

Bug Fixes

Support added for new National Instruments devices

Additional data acquisition hardware support was added for NI 9242 C Series, NI 9244 C Series, NI USB-6001, NI USB-6002, NI USB-6003, NI 9222 (BNC) C Series and NI 9223 (BNC) C Series devices.

R2014b

Version: 3.6

New Features

Bug Fixes

Enhanced analog output stability for National Instruments devices

Analog output using National Instruments devices with Data Acquisition Toolbox is now more stable.

Support for additional Measurement Computing devices

Additional data acquisition hardware support was added for USB-201, USB-204 and USB-2600 series. You can use these Measurement Computing devices in the legacy interface.

Support Added for Waveform Function Generation

You can now use Digilent Analog Discovery devices with the session-based interface to generate waveform functions. For more information see `addFunctionGeneratorChannel`.

R2014a

Version: 3.5

New Features

Bug Fixes

Multichannel Windows sound card support using the session-based interface

You can now use the 64–bit multichannel Windows sound cards with the Data Acquisition Toolbox session-based interface.

Windows DirectSound sound card support via Support Package Installer

You can now install Windows DirectSound sound card drivers via the Support Package Installer. You can use Windows DirectSound sound cards with the session-based interface.

Support for National Instruments NI-DAQmx devices via Support Package Installer

You can now install National Instruments NI-DAQmx device drivers via the Support Package Installer. You can use National Instruments NI-DAQmx devices with the session-based interface.

R2013b

Version: 3.4

New Features

Bug Fixes

Support for Measurement Computing USB 1208FS-PLUS, USB 1408FS-PLUS, and USB 1608 FS-PLUS devices using legacy interface

You can now use the legacy interface with Measurement Computing USB 1208FS-PLUS, USB 1408FS-PLUS, and USB 1608 FS-PLUS.

Support for National Instruments CompactDAQ chassis cDAQ-9184 using session-based interface

You can now use the session-based interface with National Instruments CompactDAQ chassis NI cDAQ-9184.

R2013a

Version: 3.3

New Features

Bug Fixes

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 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

Bug Fixes

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

Bug Fixes

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 USB-6343

NI USB-6351

NI USB-6353

NI USB-6356

NI PCIe-6509

NI PXI-4472

NI PXI-6602

NI PXI-6608

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 Computing devices in the legacy interface.

R2011b

Version: 3.0

New Features

Bug Fixes

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, 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

Bug Fixes

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 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

Bug Fixes

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

Bug Fixes

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

Bug Fixes

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

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`.

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

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`.

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 `daqmem` 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

Bug Fixes

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 WLS-9234 (WLS)
NI ENET-9211 (ENET)	NI WLS-9219 (WLS)
NI PXIe-6124 (PXIe)	NI WLS-9237 (WLS)
NI ENET-9215 (ENET)	

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`.

New Hardware Support for Measurement Computing Corporation (MCC) Devices

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

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`.

R2008b

Keithley® and VXI Technology Adaptors Deprecated

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.

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

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-6212 (USB)
- NI USB-6216 (USB)
- NI USB-6281 (USB)
- NI USB-6281 (Mass Termination) (USB)
- NI USB-6289 (USB)
- NI USB-6289 (Mass Termination) (USB)
- NI USB-6509 (USB)
- NI USB-9219 (USB)
- NI USB-9229 (USB)
- NI USB-9229 (BNC) (USB)
- NI USB-9239 (USB)
- NI USB-9239 (BNC) (USB)
- NI SCXI-1112 (SCXI)
- NI SCXI-1122 (SCXI)

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`.

New Hardware Support for Measurement Computing Corporation (MCC) Devices

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

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`.

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

Bug Fixes

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)

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`.

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

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`.

R2007b

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 USB-9211A (USB)	NI PXI-6255 (PXI)
NI PCIe-6536 (PCI Express®)	NI PXI-6602 (PXI)
NI PCIe-6537 (PCI Express)	NI PXI-6608 (PXI)
NI PCI-6255 (PCI)	

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`.

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 `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 daq 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

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 `DriveAISenseToGround`, `NumMuxBoards`, and `TransferMode` 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

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

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

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/daq`.

Corrected Spelling of InputType Value Pseudodifferential

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

Bug Fixes

R14SP3+

Version: 2.8

New Features

Bug Fixes

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

```
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 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.

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.

R14SP3

Version: 2.7

Bug Fixes

R14SP2

Version: 2.6

New Features

Bug Fixes

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 daqpropedit

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 `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
```

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`

Obsolete Property Name	New Property Name
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 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.