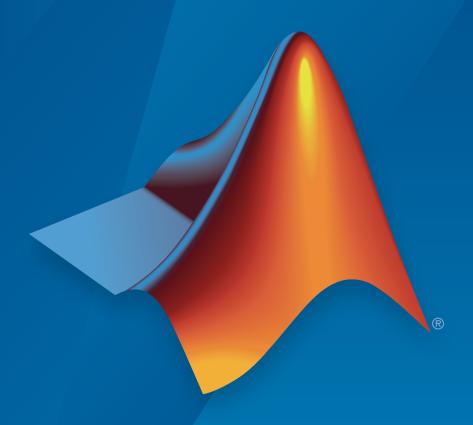
Data Acquisition Toolbox™ Release Notes



MATLAB® SIMULINK®



How to Contact MathWorks



Latest news: www.mathworks.com

Sales and services: www.mathworks.com/sales_and_services

User community: www.mathworks.com/matlabcentral

Technical support: www.mathworks.com/support/contact_us

7

Phone: 508-647-7000



The MathWorks, Inc. 3 Apple Hill Drive Natick, MA 01760-2098

Data Acquisition Toolbox™ Release Notes

© COPYRIGHT 2005–2017 by The MathWorks, Inc.

The software described in this document is furnished under a license agreement. The software may be used or copied only under the terms of the license agreement. No part of this manual may be photocopied or reproduced in any form without prior written consent from The MathWorks, Inc.

FEDERAL ACQUISITION: This provision applies to all acquisitions of the Program and Documentation by, for, or through the federal government of the United States. By accepting delivery of the Program or Documentation, the government hereby agrees that this software or documentation qualifies as commercial computer software or commercial computer software documentation as such terms are used or defined in FAR 12.212, DFARS Part 227.72, and DFARS 252.227-7014. Accordingly, the terms and conditions of this Agreement and only those rights specified in this Agreement, shall pertain to and govern the use, modification, reproduction, release, performance, display, and disclosure of the Program and Documentation by the federal government (or other entity acquiring for or through the federal government) and shall supersede any conflicting contractual terms or conditions. If this License fails to meet the government's needs or is inconsistent in any respect with federal procurement law, the government agrees to return the Program and Documentation, unused, to The MathWorks, Inc.

Trademarks

MATLAB and Simulink are registered trademarks of The MathWorks, Inc. See www.mathworks.com/trademarks for a list of additional trademarks. Other product or brand names may be trademarks or registered trademarks of their respective holders.

Patents

MathWorks products are protected by one or more U.S. patents. Please see www.mathworks.com/patents for more information.

Contents

R20)17a
Data Acquisition SDK: Create custom adaptors to extend toolbox capabilities to third-party vendors and devices	1-2
Measurement Computing Support: Acquire data from Measurement Computing data acquisition hardware	1-2
R20	16b
Simulink Blocks: Acquire and generate data in Simulink models using National Instruments, Analog Devices, and Digilent hardware	2-2
Hardware Support: Connect to additional National Instruments DAQ devices	2-2
Advanced tab completion for functions	2-3
R20)16a
Hardware Support: Measure and source voltage and current from Analog Devices ADALM1000 hardware	3-2
Legacy interface removed	3-2

3-	Functionality being removed or changed
)15	R20
4.	Support for additional National Instruments DAQ devices .
4-	Removal of 32-bit MATLAB and the legacy interface
)15	R20
5-	Support added for new National Instruments devices
)14	R20
6-	Enhanced analog output stability for National Instruments devices
6-	Support for additional Measurement Computing devices
6-	Support Added for Waveform Function Generation
)14	R20

Windows DirectSound sound card support via Support Package Installer	7-2
Support for National Instruments NI-DAQmx devices via Support Package Installer	7-2
R20	13b
Support for Measurement Computing USB 1208FS-PLUS, USB 1408FS-PLUS, and USB 1608 FS-PLUS devices using legacy interface	8-2
Support for National Instruments CompactDAQ chassis cDAQ-9184 using session-based interface	8-2
R20	13a
Support for clocked digital I/O on National Instruments devices using session-based interface	9-2
Support Package for Digilent Analog Discovery design kit used in circuits courses	9-2
Support for array binary-to-decimal conversion	9-2
R20	12b
Support for Digital I/O on National Instruments devices using session-based interface	10-2

AutoSyncDSA Property for automatically synchronizing National Instruments DSA devices using RTSI or PXI bus in session-based interface Support for additional National Instruments devices using session-based interface	10-2 10-2
R2	012a
Session Synchronization Capability	11-2
Support Added for Microphone Channels	11-2
Support Added for IEPE Channels	11-2
Support Added for New National Instruments CompactDAQ Chassis	11-2
Support Added for New National Instruments Devices	11-2
Support Added for New Measurement Computing Devices	11-3
R20	011b
Expanded Support for National Instruments Devices in the Session-Based Interface	12-2
Support Added for Bridge Measurements	12-2
Support Added for RTD Channels	12-2
Support Added for New Thermocouple Device	12-2
Support Removed for Two National Instruments USB Devices	12-2

R	9	Λ	1	1	_
K.	Z	u	•		ล

Support Added for Counters and Timers	13-2
Support Added for IEPE Accelerometer Measurements	13-2
Support Added for NI-DAQmx Devices	13-2
New Hardware Support for National Instruments Chassis- Based Devices	13-2
64-Bit Windows Support	13-2
NI-DAQmx Driver Requirement	13-3
R20	010b
Support Added for National Instruments CompactDAQ Devices	14-2 14-2
New Hardware Support	14-2
	040
R20	010a
New Hardware Support for National Instruments (NI) X Series Devices	010a 15-2

New Hardware Support for Measurement Computing Corporation (MCC) Devices	15-2
New Hardware Support for NI-ELVIS II Devices	15-8
R2	009k
New Hardware Support for National Instruments (NI) Devices	16-2
New Hardware Support for Measurement Computing Corporation (MCC) Devices	16-2
New Version of InstaCal Driver Required	16-
Change in daqmem Output	16-
R2	2009a
New Hardware Support for National Instruments (NI) Devices	17-
New Hardware Support for Measurement Computing Corporation (MCC) Devices	17-
m R2	0081
Keithley® and VXI Technology Adaptors Deprecated	18-
Warning Added for Future Deprecation of National Instruments Traditional NI-DAQ Adaptor	18-

Adaptors	18-2
Data Acquisition Toolbox RTSI Bus Support	18-2
New Hardware Support for National Instruments (NI) Devices	18-3
New Hardware Support for Measurement Computing Corporation (MCC) Devices	18-3
Expanded Data Acquisition Toolbox Demos	18-3
R	2008a
Data Acquisition Toolbox Block Library	19-2
New Hardware Support for National Instruments (NI) Devices	19-2
New Hardware Support for Measurement Computing Corporation (MCC) Devices	19-2
R	2007b
New Hardware Support for National Instruments (NI) Devices	20-2
Enhanced Performance of getsample and putsample Functions	20-2
StandardSampleRates Property Defaults Changed	20-2
Upgrading from an Earlier Release	20-2 20-2

Three Analog Properties Hidden	20-8
R20	07a
New Hardware Support	21-2
Γime Series Support	21-2
Warning Added for Future Deprecation of Keithley and VXI Technology Adaptors	21-2
R200	06b
Data Acquisition Toolbox Block Library	22 -2
New Hardware Support	22-2
Corrected Spelling of InputType Value Pseudodifferential	22 -2
R20	06a
Bug Fixes	
R14SI	P3+

Upgrading from an Earlier Release			

R14SP3

Bug Fixes

R14SP2 New Functions: islogging, isrunning, and issending 26-2 Using PFI or RTSI Channels for Triggers and Clocks **26-2** peekdata Allows Type Parameter **26-2** Property Inspector Replaces dagpropedit **26-2** 26-3 waittilstop Function Renamed wait Upgrading from an Earlier Release **26-3 26-3 26-4** Return Format of dagfind 26-4 peekdata and getdata Number of Samples **26-4** waittilstop Function Renamed wait **26-5** dagpropedit Replaced by inspect 26-5

R2017a

Version: 3.11

New Features

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 ToolboxTM. 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 ComputingTM devices for analog input and analog output voltage operations. Among the devices now supported are the following:

USB-1208LS USB-2020	
USB-1208FS-Plus * USB-205	
USB 1408FS-Plus * USB-234	
USB-1608FS	
USB-1608FS-PLUS USB-2637	
USB-1608GX-2AO PCI-DAS60	35
USB-1616HS-4 PCI-DAS60	71
PCI-DAS60	52

^{*} 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

Version: 3.10

New Features

Bug Fixes

Compatibility Considerations

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.

CompactDAG Controllers	C Series Devices	X Series Devices	Dynamic Signal Acquisition Devices	SC Express Devices
	NI 9230 (BNC) NI 9232 (BNC) NI 9251 NI 9436	PXIe-6378 PXIe-6345 PXIe-6355 PXIe-6365 PXIe-6375	PXIe-4464	PXIe-4339

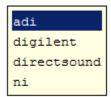
For a full list of supported hardware for the Data Acquisition Toolbox, see Hardware Support.

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:.



```
>> s = dag.createSession()
```

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**:



```
>> ch = addAudioOutputChannel(s,'Audio
```

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

Version: 3.9

New Features

Bug Fixes

Compatibility Considerations

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	
<pre>ai = analoginput('nidaq','Dev1');</pre>	s = daq.createSession('ni');	
addchannel(ai,0);	addAnalogInputChannel(s,'Dev1',1,'volt	age')'
start(ai);		
<pre>data = getdata(ai);</pre>	<pre>data = startForeground(s);</pre>	

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, addAnalogInputChan addAnalogOutputCha	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.
analoginput, analogoutput	Error	daq.createSession, addAnalogInputChan addAnalogOutputCha	

Functionality	Result	Use Instead	Compatibility Considerations
			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.
getdata	Error	startForeground, startBackground, DataAvailable	Use the session interface instead.
getsample, getvalue	Error	inputSingleScan	Use the session interface instead.

Functionality	Result	Use Instead	Compatibility Considerations
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.
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.

Functionality	Result	Use Instead	Compatibility Considerations
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

Version: 3.8

New Features

Bug Fixes

Compatibility Considerations

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, 9344, and 9361 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. Considerations of the control of the control

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

R2015a

Version: 3.7

New Features

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

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 DiscoveryTM devices with the session-based interface to generate waveform functions. For more information see addFunctionGeneratorChannel.

R2014a

Version: 3.5

New Features

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

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

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

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

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 Computing devices in the legacy interface.

R2011b

Version: 3.0

New Features

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

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

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

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	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

New Hardware Support for National Instruments (NI) Devices

Additional data acquisition hardware support was added as follows:

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/dag.

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

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/dag.

R2008b

Version: 2.13

New Features

Bug Fixes

Compatibility Considerations

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-9219 (USB) NI USB-6212 (USB) NI USB-9229 (USB)

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

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

NI USB-6289 (USB)

NI SCXI-1112 (SCXI)

NI USB-6289 (Mass Termination) (USB)

NI SCXI-1122 (SCXI)

NI USB-6509 (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.

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

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

Version: 2.11

New Features

Bug Fixes

Compatibility Considerations

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 <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

Bug Fixes

Compatibility Considerations

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/dag.

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

Version: 2.9

New Features

Bug Fixes

Compatibility Considerations

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 Pseudodifferential. 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

R14SP3+

Version: 2.8

New Features

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.

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

R14SP2

Version: 2.6

New Features

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 dagdevice/inspect

Typing dappropedit 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

Obsolete Property Name	New Property Name
SamplesAcquiredActionCount	SamplesAcquiredFcnCount
SamplesOutputAction	SamplesOutputFcn
SamplesOutputActionCount	SamplesOutputFcnCount
StartAction	StartFen
StopAction	StopFen
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

dappropedit 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 dagdevice/inspect

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