Release Notes for Instrument Control Toolbox™

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Release Notes for Instrument Control Toolbox™

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No New Features or Changes

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R2012b

Version: 3.2
New Features: Yes
Bug Fixes: Yes

Bluetooth support in Test & Measurement Tool

In R2011b, the toolbox introduced support for Bluetooth®. In R2012b, this support is extended to the Test & Measurement Tool.

To use the Bluetooth support in the Test & Measurement Tool, select the **Bluetooth** node in the instrument tree and right-click **Scan for bluetooth devices**.

For more information on the Bluetooth interface, see "Controlling Instruments Using Bluetooth". For information on using it in the Test & Measurement Tool, see the Help within the tool by selecting the **Bluetooth** node in the tree.

Quick-Control Function Generator now supports Agilent instruments

In R2012a, the toolbox introduced a new method to communicate with function generators, the Quick-Control Function Generator, for use with function generators using IVI-C drivers. In R2012b, the Quick-Control Function Generator is extended for use with Agilent® function generators using SCPI commands.

Create the Quick-Control Function Generator object using the Instrument Control Toolbox™ `fgen` function. It provides simplified controlling of function generators and performs arbitrary waveform generation without dealing with the underlying drivers.

For information on prerequisites, functions that work with the Quick-Control Function Generator, and a full workflow example, see "Using Quick-Control Function Generator". For additional information, see "Using a SCPI-Based Driver for Agilent Function Generators" at the end of the section .

R2012a

Version: 3.1
New Features: Yes
Bug Fixes: Yes

I2C Support

The toolbox now supports I2C communication, which is Inter-Integrated Circuit communication. Instrument Control Toolbox I2C support lets you open connections with individual chips and read and write over the connections to individual chips.

The I2C interface lets you do chip-to-chip communication using an Aardvark host adaptor. Some applications of this interface include communication with SPD EEPROMs and NVRAM chips, communication with SMBus devices, accessing low-speed DACs and ADCs, changing settings on color monitors using the display data channel, changing sound volume in intelligent speakers, reading hardware monitors and diagnostic sensors, and turning on or off the power supply of system components.

To identify I2C devices in the Instrument Control Toolbox, use the `instrhwinfo` function on the I2C interface, called `i2c`.

For information on using the I2C interface, see Controlling Instruments Using I2C in the Instrument Control Toolbox documentation.

Quick-Control Oscilloscope Now Supports Tektronix Scopes

In R2011b the toolbox introduced a new method to communicate with oscilloscopes, the Quick-Control Oscilloscope, for use with scopes using IVI-C or IVI-COM drivers. In R2012a, the Quick-Control Oscilloscope is extended for use with Tektronix® scopes.

Create the Quick-Control Oscilloscope object using the Instrument Control Toolbox `oscilloscope` function. It simplifies controlling oscilloscopes and performs waveform acquisitions without dealing with the underlying drivers.

For information on prerequisites, functions that work with the Quick-Control Oscilloscope, and a full workflow example of using it, see Using Quick-Control Oscilloscope. For an example using a Tektronix scope, see Reading Waveforms Using a Tektronix Oscillscope.

Quick-Control Function Generator

A new method of communicating with instruments, Quick-Control Instruments, was introduced in R2011b with the Quick-Control Oscilloscope. In R2012a, a second instrument class is introduced – the Quick-Control Function Generator. You can use this new function generator, or fgen, for simplified fgen control and waveform acquisition.

Create the Quick-Control Function Generator object using the Instrument Control Toolbox `fgen` function. It provides simplified controlling function generators and performs arbitrary waveform acquisitions without dealing with the underlying drivers. You can use it with function generators using IVI-C drivers.

For information on prerequisites, functions that work with the Quick-Control Function Generator, and a full workflow example, see Using Quick-Control Function Generator.

New IVI Class Supported

You can now use the following IVI instrument class with Instrument Control Toolbox:

- `IviACPwr` – IVI AC Power instrument class.

See Using MATLAB® IVI Wrappers for more information on using the classes. See Getting Started with IVI Drivers for a list of supported classes.

IVI-C Class Compliant Wrappers in Test & Measurement Tool

In R2010b the toolbox introduced support for IVI-C class compliant wrappers. The IVI-C wrappers provide an interface to MATLAB for instruments running with IVI-C class compliant drivers, including 64-bit support. In R2012a, this support is extended to the Test & Measurement Tool.

View the IVI-C nodes by setting a preference in MATLAB. In **File > Preferences**, go to **Instrument Control**. Then select the **Show IVI Instruments in TMTool** option in the **IVI Instruments** section. Then when you start the Test & Measurement Tool, the new **IVI Instruments** node appears under **Instrument Drivers**.

For more information, see Using IVI-C Class-Compliant Wrappers. For information on using it in the Test & Measurement Tool, see the Help within the tool by selecting the **IVI Instruments** node in the tree.

R2011b

Version: 3.0
New Features: Yes
Bug Fixes: Yes

Bluetooth Support

The toolbox now supports Bluetooth devices. Instrument Control Toolbox supports the Bluetooth serial port profile (SPP).

The Instrument Control Toolbox Bluetooth interface lets you connect to devices over the Bluetooth interface and to transmit and receive ASCII and binary data. You can identify any SPP Bluetooth device and establish a two-way connection with that device.

Bluetooth is an open wireless technology standard for exchanging data over short distances using short wavelength radio transmissions from fixed and mobile devices using a packet-based protocol. Bluetooth provides a secure way to connect and exchange information between devices such as Lego Mindstorm NXT robots, USB Bluetooth adaptors (dongles), wireless sensors, mobile phones, faxes, laptops, computers, printers, GPS receivers, etc.

To identify Bluetooth devices in the Instrument Control Toolbox, use the `instrhwinfo` function on the Bluetooth interface, called `Bluetooth`.

For information on using the Bluetooth interface, see Controlling Instruments Using Bluetooth.

Quick-Control Oscilloscope

A new family of instrument support, Quick-Control Instruments, is being introduced. For R2011b, the Quick-Control Oscilloscope is available. You can use this new oscilloscope function for simplified oscilloscope control and waveform acquisition.

Create the Quick-Control Oscilloscope object using the Instrument Control Toolbox `oscilloscope` function. It provides a simplified way to control oscilloscopes and perform waveform acquisitions without dealing with the underlying drivers. It can be used with scopes using IVI-C or IVI-COM drivers.

For information on prerequisites, functions that work with the Quick-Control Oscilloscope, and a full workflow example of using it, see Using Quick-Control Oscilloscope.

Generic VISA Support

In both the command-line and the Test & Measurement Tool, a generic VISA interface is now supported. In the Test & Measurement Tool, generic devices appear in the **More** node under the **VISA** node. In the command-line toolbox, they are available as a type 'generic'.

For example, if you have a generic VISA device that is made by National Instruments®, you could use the instrhwinfo function to see it:

```
instrhwinfo('visa','ni','generic')
```

You can use this generic support to communicate over open VISA sockets, USB Raw, etc.

For more information, see Working with the Generic Interface.

VISA Node and Generic VISA Support in the Test & Measurement Tool

In the Test & Measurement Tool, instruments that use the VISA interface now appear under the **VISA** node in the instrument tree. For example, if you are using a TCP/IP instrument with the VISA interface, instead of a **TCP/IP - VISA** node in the tree, you will see a **VISA** node, with a **TCP/IP** node under it. It is easier to see what protocols are using the VISA interface with the **VISA** node.

Also, the generic VISA interface is now supported. Generic devices appear in a **More** node under the **VISA** node in the instrument tree. If your instrument is recognizable as a `type` such as `'gpib'` or `'tcpip'`, it appears in that type-specific node. For example, a TCP/IP instrument appears in the **TCPIP** node under the **VISA** node. But if it is a generic instrument, it appears in the **More** node.

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Conversion of Error and Warning Message Identifiers
Compatibility Considerations: Yes

For R2011b, error and warning message identifiers have changed in the
Instrument Control Toolbox software.

Compatibility Considerations

Compatibility Considerations

If you have scripts or functions that use message identifiers that changed, you
must update the code to use the new identifiers. Typically, message identifiers
are used to turn off specific warning messages, or in code that uses a try/catch
statement and performs an action based on a specific error identifier.

For example, the <'illustrative:old:ID'> identifier has changed to
<'new:similar:ID'>. If your code checks for <'illustrative:old:ID'>, you
must update it to check for <'new:similar:ID'> instead.

To determine the identifier for a warning, run the following command just after you see the warning:

```
[MSG,MSGID] = lastwarn;
```

This command saves the message identifier to the variable MSGID.

To determine the identifier for an error, run the following command just after you see the error:

```
exception = MException.last;
MSGID = exception.identifier;
```

Note: Warning messages indicate a potential issue with your code. While you can turn off a warning, a suggested alternative is to change your code so it runs warning-free.

R2011a

Version: 2.12
New Features: Yes
Bug Fixes: Yes

Support for Three New IVI Classes

You can now use the following three IVI instrument classes with the Instrument Control Toolbox software:

- Upconverter
- Downconverter
- Timercounter

See Using MATLAB IVI Wrappers for more information on using the classes. See Getting Started with IVI Drivers for a list of supported classes.

IVI-C Class Compliant Wrapper

The eight supported classes of IVI instruments are now supported for IVI-C using class compliant wrappers. This includes 64-bit support for IVI-C drivers.

The IVI-C wrappers provide an interface to MATLAB for instruments running on IVI-C class compliant drivers.

For more information, see Using IVI-C Class-Compliant Wrappers.

Server Sockets Support

Support for Server Sockets is available, using the `NetworkRole` property on the TCP/IP interface. This support is for a single remote connection. You can use this connection to communicate between a client and MATLAB, or between two instances of MATLAB.

For example, you might collect data such as a waveform into one instance of MATLAB, and then want to transfer it to another instance of MATLAB.

For more information, see Using TCP/IP Server Sockets.

Known Issue – TCP/IP Endian Default

For the TCP/IP and UDP interfaces, the Endian value of the `ByteOrder` property defaults to `bigEndian`. This may cause problems if you need to use `littleEndian`. You should match the byte order of the machine you are connecting to.

R2010b

Version: 2.11
New Features: Yes
Bug Fixes: Yes

Support for IVI Class for Digitizers

You can now use the IviDigitizer class with the Instrument Control Toolbox software. See Using MATLAB IVI Wrappers for more information.

Support for IVI Class for Switches

You can now use the IviSwtch class with the Instrument Control Toolbox software. See Using MATLAB IVI Wrappers for more information.

Support for National Instruments NI-SCOPE Driver Software

You can now use Instrument Control Toolbox with instruments using the NI-SCOPE version 3.4 driver software.

Support for National Instruments NI-FGEN Driver Software

You can now use Instrument Control Toolbox with instruments using the NI-FGEN version 2.7.2 driver software.

Enhanced TCP/IP Performance for fread and binblockread Functions

`fread` and `binblockread` functions are now enhanced with better TCP/IP throughput.

Two New UDP Packet Size Properties

The `InputDatagramPacketSize` and `OutputDatagramPacketSize` properties allow you to control the size of the datagram packets and work with larger packets.

R2010a

Version: 2.10
New Features: Yes
Bug Fixes: Yes

Expanded spoll Function

You can now use the spoll function to execute a serial poll on VISA objects.

Enhanced Test and Measurement Tool

The Test and Measurement Tool interface is enhanced as follows:

- Enhanced desktop environment
- Two new menu items, **Desktop** and **Window**, which give you more control of the tool's size, location and layout

Support for Agilent 64-Bit GPIB on Windows 64

You can now use Instrument Control Toolbox with an Agilent 64-bit GPIB interface on a Windows 64-bit platform.

R2009b

Version: 2.9
New Features: Yes
Bug Fixes: Yes

New Class-Compliant Interface for IVI-COM Drivers

Instrument Control Toolbox includes a class-compliant interface for IVI-COM drivers that lets you switch among instruments with different interfaces that use a class-compliant IVI-COM driver.

Support for Agilent 64-Bit VISA on Windows 64

You can now use Instrument Control Toolbox with an Agilent 64-bit VISA interface on a Windows 64-bit platform.

Warning Added for Future Deprecation of UDP Binblock Support

A warning has been added for the deprecation of `binblock` read and write operations over an UDP network in a future release of the toolbox. You will receive a warning message if you read or write to an instrument over an UDP network.

R2009a

Version: 2.8
New Features: Yes
Bug Fixes: Yes

Expanded Platform Support Added for Instrument Control Toolbox

You can now install the Instrument Control Toolbox software on all platforms.

Using the Status Function with an IVI Driver Can Cause Namespace Conflicts

If you are creating an IVI driver, use the `InstrumentStatus` function to set the status group for the vendor-specific driver status. Using `Status` can cause a namespace conflict. If you are using a MATLAB provided driver, you can continue to use the `Status` function.

Expanded Platform Support Added for NI-VISA and GPIB Interfaces

You can now use Instrument Control Toolbox with a National Instruments VISA or a GPIB interface on a Windows Vista™ 64 platform.

IVI-COM Driver Support

This version of the Instrument Control Toolbox software offers expanded IVI-COM driver coverage.

R2008b

Version: 2.7
New Features: Yes
Bug Fixes: Yes

Enhanced IVI-COM Driver Support
Compatibility Considerations: Yes

The Instrument Control Toolbox devices can now correctly initialize collections and items.

Compatibility Considerations

IVI-COM drivers generated using MAKEMID in the Instrument Control Toolbox, Version 2.7 (R2008b) will not work with versions prior to Version 2.7 (R2008b), and will throw an error. If you need to use the drivers created with Instrument Control Toolbox Version 2.7, make sure you update your license to the latest release of the MATLAB software.

After you install Instrument Control Toolbox Version 2.7, if you regenerate the MDD file, you will need to update your code. To update your code, change the way you call your collections and items. Collections are now spelled as a plural noun and items are spelled as a singular noun. For example, if you had an item called Measurements and a collection called Measurement, you need to change the code so that the item name reads Measurement and the collection name reads Measurements. The following table shows you an example of the interface and the corresponding methods as it should look once you have updated your code. The example uses the item Measurement and the collection, Measurements. The example also compares the model with the Agilent RFPowerMeter driver model.

Interface	Instrument Control Toolbox Version 2.7 driver model methods	Agilent RFPowerMeter driver methods
Measurement	`ClearLimitFails` `ConfigureRelative` `Fetch Configure` `ConfigureTimeGated` `Measure` `ConfigureAnalogOutput` `ConfigureTTLOutput` `Read ConfigureLimits` `EnableAnalogOutput`	`ClearLimitFails` `ConfigureRelative` `Fetch Configure` `ConfigureTimeGated Measure` `ConfigureAnalogOutput` `ConfigureTTLOutput` `Read ConfigureLimits` `EnableAnalogOutput`

Interface	Instrument Control Toolbox Version 2.7 driver model methods	Agilent RFPowerMeter driver methods
	ConfigureOffset EnableTTLOutput	ConfigureOffset EnableTTLOutput
Measurements	Abort IsOperationComplete Initiate	Abort IsOperationComplete Initiate

Here is another example showing the corresponding properties of the two sample interfaces, Measurement and Measurements. This example also compares the model with the Agilent RFPowerMeter driver model.

Interface	Instrument Control Toolbox Version 2.7 driver model properties	AgilentRFPowerMeter driver model properties
Measurement	Feed1Channel Feed1Gate Feed1Type Feed2Channel Feed2Gate Feed2Type LimitAutoClear LimitEnabled LimitFails LimitLower LimitUpper Offset OffsetEnabled Operation RatioUnits RelativeEnabled Resolution Units	Feed1Channel Feed1Gate Feed1Type Feed2Channel Feed2Gate Feed2Type LimitAutoClear LimitEnabled LimitFails LimitLower LimitUpper Offset OffsetEnabled Operation RatioUnits RelativeEnabled Resolution Units
Measurements	Count Name Item	Count Name Item

Enhanced Functionality of the Test and Measurement Tool

Test and Measurement Tool now has advanced interaction between the hardware interfaces and the instrument driver.

Enhanced IVI-C Driver Support

Instruments that require a reset will now work with IVI-C drivers in the Instrument Control Toolbox product.

Expanded Instrument Control Toolbox Demos

The Instrument Control Toolbox product now has a new demo that uses an IVI-COM driver with a mixed signal oscilloscope.

Expanded spoll Documentation

The low-level GPIB `spoll` function now has more documentation to help you work with serial poll.

R2008a

Version: 2.6
New Features: Yes
Bug Fixes: Yes

Instrument Control Toolbox Block Library

There are three new Simulink® blocks that can send and receive data via a serial port in Simulink.

- **Serial Configuration** — Configure the parameters for a serial port that you can use to send and receive data.

- **Serial Receive** — Receive binary data over a serial port.

- **Serial Send** — Send binary data over a serial port.

Improved Throughput

Throughput is improved in the Instrument Control Toolbox Serial interface and TCP/IP Receive blocks.

Instrument Drivers

Several new instrument drivers have been added to MATLAB Central.

Enhanced Capability of the TM Tool

The capability for discovery of VISA-USB and VISA TCP/IP (VXI-11) instruments in the TM TOOL is now enhanced.

Support for Agilent IO Libraries Suite 15.0

The Instrument Control Toolbox software now supports the Agilent IO
Libraries Suite 15.0.

fprintf Timeout Errors

You will no longer see sporadic timeouts when you write to the serial port using `fprintf`.

R2007b

Version: 2.5
New Features: Yes
Bug Fixes: Yes

Instrument Control Toolbox Block Library

There are four new Simulink blocks that can send and receive data over TCP/IP and UDP in Simulink.

- **TCP/IP Receive** — Receive data over a TCP/IP network from a specified remote machine.

- **TCP/IP Send** — Send data over a TCP/IP network to a specified remote machine.

- **UDP Receive** — Receive data over an UDP network from a specified remote machine.

- **UDP Send** — Send data over an UDP network to a specified remote machine.

Instrument Drivers

- Additional instrument drivers are now available for Agilent, LeCroy®, Tabor, and Tektronix instruments.

- Support for Keithley® version 8.3 GPIB drivers is updated.

spoll GPIB Status Information

Additional GPIB status information is now provided with the spoll function.

Obsolete Functions
Compatibility Considerations: Yes

The following functions are obsolete as of this release. Any attempt to use these functions now results in an error message.

Obsolete Function Name	New Function Name
freeserial	fclose
instrcomm	tmtool
instrcreate	tmtool

Compatibility Considerations

In the previous release, freeserial was nonoperational and generated a warning. Now any call to this function generates an error.

In previous releases, instrcomm and instrcreate opened their own graphical user interfaces. The functionality of these interfaces is available in the tmtool GUI.

New Error Message
Compatibility Considerations: Yes

The fwritef and the fprintf functions will return an error message if the flowcontrol property is set to hardware and a hardware connection is not detected. Previously, MATLAB software would fail to respond while it waited for the connection.

Compatibility Considerations

In the previous release, MATLAB software would become unresponsive if the flowcontrol property was set to hardware and a hardware connection was not detected. The fwrite and the fprintf functions will now return an error message.

R2007a

Version: 2.4.2
New Features: Yes
Bug Fixes: No

Confirmation Dialog Preference Settings Moved
Compatibility Considerations: Yes

The preferences for setting whether a dialog box confirms that you want the
MATLAB Instrument Driver Editor and the MATLAB Instrument Driver
Testing Tool to create new files are in a new location. You now access them
in the `General` > `Dialog Confirmations` node of the MATLAB Preferences
dialog box.

For details on these Instrument Control preference settings, see General
Preferences for Instrument Control in the Instrument Control User's Guide
documentation.

Compatibility Considerations

In previous versions of MATLAB and Instrument Control Toolbox software,
these dialog box preferences were found under the `Instrument Control` node
of the Preferences dialog box.

R2006b

Version: 2.4.1
New Features: No
Bug Fixes: No

No New Features or Changes

R2006a

Version: 2.4
New Features: Yes
Bug Fixes: No

Generic Instrument Drivers Supported

This release includes support for generic instrument drivers that allow Instrument Control Toolbox software to communicate with devices or software that do not use industry-standard drivers or protocols.

For more information, see Using Generic Instrument Drivers in the Instrument Control Toolbox documentation.

LeCroy Driver

This release includes support for LeCroy instrument drivers.

Several drivers ship with the toolbox. You can find these drivers by looking in the directory

matlabroot\toolbox\instrument\instrument\drivers

where *matlabroot* is the MATLAB installation directory, as seen when you type

matlabroot

in the MATLAB Command Window.

Many other drivers are available on the MathWorks Web site at

http://www.mathworks.com/matlabcentral/fileexchange

including drivers specifically for Instrument Control Toolbox software under the Test and Measurement category.

Agilent Instrument Simulations

Instrument Control Toolbox software includes simulations of the Agilent 33120a function generator and Agilent e3648 DC power supply. These simulations are available as instrument drivers.

You can see the drivers shipped with the release by looking in the directory

matlabroot\toolbox\instrument\instrument\drivers

where *matlabroot* is the MATLAB installation directory, as seen when you type

matlabroot

in the MATLAB Command Window.

The Agilent simulations are provided by the drivers

```
generic_agilent_33120a.mdd
generic_agilent_e3648a.mdd
```

R14SP3

Version: 2.3
New Features: No
Bug Fixes: No

No New Features or Changes

R14SP2

Version: 2.2
New Features: Yes
Bug Fixes: No

Advantech GPIB Supported

Supported GPIB interfaces now include Advantech® GPIB.

For further information, type

`instrhelp gpib`