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\*\*\*\* Read Me First \*\*\*\*  
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Version 2.0.0.0

October 30th, 2009

### Introducing the Keithley IVI Driver for the 3390 Arbitrary Waveform Generator

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The instrument driver provides access to the functionality of the Keithley 3390 through a COM server which also complies with the IVI specifications. Version 2.0.0 now includes an IVI-C wrapper around the IVI-COM driver. This driver works in any development environment which supports COM programming including Microsoft® Visual Basic, Microsoft Visual C++, Microsoft .NET, Agilent VEE Pro, National Instruments LabVIEW, and others.

### Supported Instruments

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3390

### Installation

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**System Requirements:** The driver installation will check for the following requirements. If not found, the installer will either abort, warn, or install the required component as appropriate.

### Supported Operating Systems:

Windows 2000  
Windows XP  
Windows Vista

### Shared Components

Before this driver can be installed, your computer must already have several components already installed. The easiest way to install these other components is by running the IVI Shared Components installation package available from the IVI Foundation as noted below. It installs all the items mentioned below.

IVI Shared Components version 1.2.1.0 or later.

The driver installer requires these components. They must be installed before the driver installer can install the driver.

The IVI Shared Components installer is available from:

<http://www.ivifoundation.org/Downloads/SharedComponents.htm>

To install, open or run the file: IviSharedComponents.msi

If the driver installer exhibits problems with installing the IVI Shared Components, find the program IviSharedComponents.msi and Run the program. It is able to install many of the required system components, including Windows Installer 2.0.

**Windows Installer**

Version 2.0 or later. The IVISharedComponents.exe program will install version 2.0 of the Windows installer.

It is also available from:

For Win98/Me:

<http://www.microsoft.com/downloads/release.asp?ReleaseID=32831>

For Win2000/XP:

<http://www.microsoft.com/downloads/release.asp?ReleaseId=32832>

**Microsoft XML 4.0**

The Configuration Server, an IVI Shared Component, uses Microsoft's XML 4.0 parser. The IVI Shared Components will install the XML 4.0 parser. You can download the parser and its associated SDK from:

<http://microsoft.com/downloads>

Enter "xml 4.0" as keywords.

**MS Windows® Script**

Typically, wscript.exe is installed as part of the operating system or with Internet Explorer. If you see an error about wscript.exe, you need to install the Windows Script.

Download from:

<http://msdn.microsoft.com/downloads>

Enter "windows script" as keywords. Use the one appropriate for your Operating System.

**VISA-COM**

Any compliant implementation is acceptable. Typically, VISA-COM is installed with VISA and other I/O library modules.

If you are using Agilent Technologies' VISA-COM, use version 2.4.0.4 or later. The latest version of Agilent's IO Libraries includes the required version of VISA-COM.

!!!!IMPORTANT!!!!

If you are using NI VISA version 3.3 or earlier, you may need to manually register the Basic Formatted I/O component. This file is called BasFrmIO.dll and is located in C:\VXIPnP\VisaCom directory. If you installed VISA to an alternate location, then the component will be located in the VisaCom subdirectory of that directory.

**I/O**

If you are using Agilent Technologies' IO Libraries, use version M.01.01.04 or later. You can download the latest version from:  
<http://www.agilent.com/find/iolibforivicom>

If you are using National Instruments I/O libraries, use NI-VISA version 3.0.1 or later and NI-488.2 version 2.2 or later.

Sending commands directly to the instrument (bypassing the driver) via Direct IO using the System.IO interface will not work with Agilent IO Libraries prior to Agilent IO Libraries Suite 14.0.

## Additional Setup

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### .NET Framework

The .NET Framework itself is not required by this driver. If you plan to use the driver with .NET, Service Pack 2 is required.

Download from:

<http://msdn.microsoft.com/netframework/downloads/updates/sp/default.asp>

The .NET Framework requires an interop assembly for a COM server. A Primary Interop Assembly, along with an XML file for IntelliSense is installed with the driver. The driver's PIA, along with IVI PIAs are installed, by default, in:

<drive>:\Program Files\IVI\Bin\Primary Interop Assemblies

The PIA is also installed into the Global Assembly Cache (GAC) if you have the .NET framework installed.

## Start Menu Shortcuts

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A shortcut to the driver help file is added to the Start Menu, Programs, IVI, Keithley3390 group. It contains "Getting Started" information on using the driver in a variety of programming environments as well as documentation on IVI and instrument specific methods and properties.

You will also see shortcuts to the Readme file and any programming examples for this driver.

## Help File

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The help file (Keithley3390.chm) is located in the directory:

<drive>:\Program Files\IVI\Drivers\Keithley3390

## MSI Installer

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The installation package for the driver is distributed as an MSI 2.0 file. You can install the driver by double-clicking on the file. This operation actually runs:

msiexec /i Keithley3390.msi

You can run msieexec from a command prompt and utilize its many command line options. There are no public properties which can be set from the command line.

## Uninstall

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This driver can be uninstalled like any other software from the Control Panel using "Add or Remove Programs".

To uninstall the IVI Shared Components you must use the IVI Cleanup Utility available from the IVI Foundation at:

<http://www.ivifoundation.org/>

Note: All IVI-COM drivers require the IVI Shared Components to function. To completely remove IVI components from your computer, uninstall all drivers then run the IVI Cleanup Utility. This utility does not remove any IVI drivers.

## Using a New Version of the Driver

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New versions of this Keithley IVI-COM driver may have a new ProgId.

If you use the version dependent ProgId in CoCreateInstance, you will need to modify and recompile your code to use the new ProgID once you upgrade to the next version of the driver. Doing a side-by-side installation of the driver to use multiple versions of the driver is not supported. If you need to go back to an older version of the driver, you need to uninstall the later version and install the older version.

If you use the version independent ProgId in CoCreateInstance, you will not need to modify and recompile your code. The new version of the driver has been tested to be backwards compatible with previous versions.

To access the new functionality in a new version of the driver you will need to use the latest numbered IKeithley3390[n] interface rather than the IKeithley3390 interface. The IKeithley3390[n].<interface> property will return a pointer to the new IKeithley3390<interface>[n] interface. The IKeithley3390<interface>[n] interface contains the methods and properties for the new functionality. The new interfaces were introduced rather than modifying the existing interfaces for backwards compatibility. The interfaces that were previously shipped have not been changed.

## Known Issues

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**!!!!IMPORTANT!!!!**

If you are using NI VISA version 3.3 or earlier, you may need to manually register the Basic Formatted I/O component. This file is called BasFrmIO.dll and is located in C:\VXIPnP\VisaCom directory. If you installed VISA to an alternate location, then the component will be located in the VisaCom subdirectory of that directory.

**Support**

To report issues or provide feedback about this instrument driver, please send an email to [InstrumentDrivers@keithley.com](mailto:InstrumentDrivers@keithley.com)

**Revision History**

Version	Date	Notes
0.1.0.0	Jun 30, 2008	Internal release
0.2.0.0	Jul 22, 2008	Internal release
1.0.0.0	Aug 12, 2008	Initial public release
2.0.0.0	Oct 30, 2009	Added IVI-C driver and 3 LabWindows examples

**IVI Shared Component Revisions**

1.3.2.4	IviConfigServer.dll
1.0.7.0	IviConfigServerCAPI.dll
1.1.0.0	IviCShared.dll
1.0.237.0	IviCSharedSupport.dll
2.0.0.0	IviDCPwrTypeLib.dll
3.0.0.0	IviDmmTypeLib.dll
1.0.0.0	IviDriverTypeLib.dll
1.1.1.0	IviEventServer.exe
1.1.1.0	IviEventServerDLL.dll
1.1.1.0	IviEventServerDLLps.dll
1.1.1.0	IviEventServerps.dll
3.0.0.0	IviFgenTypeLib.dll
1.0.236.0	IviFloat.dll
1.0.0.0	IviPwrMeterTypeLib.dll
1.1.0.0	IviRfSigGenTypeLib.dll
3.0.0.0	IviScopeTypeLib.dll
1.0.1.2	IviSessionFactory.dll
1.2.1.0	IviSharedComponentVersion.dll
1.0.0.0	IviSpecAnTypeLib.dll
3.0.0.0	IviSwtchTypeLib.dll

**IVI Compliance**

(The following information is required by IVI 3.1 section 5.21.)

IVI-COM/IVI-C Specific Instrument Driver  
IVI Instrument Class: IviFgen  
IviFgen: IVI-4.3\_v3.1

IviFgenBase	yes
IviFgenArbFrequency	yes
IviFgenArbWfm	yes
IviFgenArbSeq	no
IviFgenBurst	yes
IviFgenInternalTrigger	yes
IviFgenModulateAM	yes
IviFgenModulateFM	yes
IviFgenSoftwareTrigger	yes
IviFgenStdFunc	yes
IviFgenTrigger	yes

**Optional Features:** This driver does not support Interchangeability Checking, State Caching, or Coercion Recording.

**Driver Identification:**

(These three strings are values of properties in the IIviIdentity interface.)

Vendor: Keithley Instruments.

Description: 3390 Arbitrary Waveform Generator.

Revision: 2.0

**Component Identifier:** Keithley3390.Keithley3390

(The component identifier can be used to create an instance of the COM server.)

**Prefix:** ke3390

**Hardware:** This driver supports instruments manufactured by Keithley.

The supported model numbers are:

3390

This driver supports communicating with the instrument using either GPIB, or LAN. LAN communication uses VXI-11 or socket communications on port 5025.

**Software:** See the section on installation in this document for information on what other software is required by this driver.