

Keithley Instruments

KIOL-850C07

Release Notes for Version C07

Keithley I/O Layer, including the Keithley Configuration Panel and Wizard,
Keithley Communicator, and VISA runtime

3/30/2015

This document provides additional information for the installation and use of the
Keithley I/O Layer.

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1 Introduction

The Keithley I/O Layer software manages the communications between Keithley instrument drivers and software applications and the instrument itself. The I/O Layer handles differences in communications required to support GPIB, serial, Ethernet, and other communications busses so that drivers and software applications do not need to handle the differences themselves.

The Keithley I/O Layer used to be bundled in with drivers and software applications, but has been moved to a separate component to simplify and improve support.

1.1 *Included in this release*

The components described below are provided as part of the Keithley I/O Layer. Shortcuts for some of them are placed in the Keithley Instrument's folder during installation.

1.1.1 Keithley Configuration Panel and Wizard

Before a driver or application can communicate with an instrument using the Keithley I/O Layer, the instrument type, communications bus type, instrument addressing information, and communications settings must be specified. Although Keithley Instrument's drivers and applications provide default settings for these items, sometimes it is necessary to change settings or create new configurations. The Keithley configuration Panel and Wizard simplify this process.

1.1.2 Keithley Communicator

The Keithley Communicator provides a simple way to send individual commands directly to an instrument and view the response without having to write a program. This is useful for verifying instrument communications and can be a helpful debugging tool.

1.1.3 VISA Runtime

VISA (Virtual Instrument Software Architecture) software actually performs the communications with the instruments. The Keithley Configuration Panel configures VISA to work with your instruments, and the Keithley Communicator, instrument drivers, and applications use VISA to perform instrument communications.

1.1.4 Keithley SCPI-based Instrument Driver

The Keithley SCPI-based Instrument IVI-C Driver is used to support the Keithley Configuration Panel Wizard and Keithley Communicator functionality. It contains simple functions for opening, configuring, taking measurements from, and closing the instrument.

1.1.5 IVI Compliance Package (ICP)

The NI IVI Compliance Package is a software package that contains IVI class drivers and support libraries necessary for the development and use of applications that leverage IVI instrument interchangeability. The IVI Compliance Package also is based on and is compliant with the latest version of the instrument programming specifications defined by the IVI Foundation.

2 System Requirements

Pentium-class PC.

NOTE: Keithley strongly recommends that you power your computer and instrument from an Uninterruptible Power Supply (UPS) when running a critical application.

2.1 Supported Operating Systems and System Software

Microsoft Windows 8 Pro & Enterprise (32-bit & 64-bit)

Microsoft Windows 7 Professional & Enterprise & Ultimate (32-bit & 64-bit) service pack 1 or later

Microsoft Windows Vista Business & Enterprise & Ultimate (32-bit & 64-bit) service pack 2 or later

Microsoft Windows XP Professional service pack 3 or later (32-bit only)

NOTE: Microsoft Windows 95, Windows 98, Windows ME, Windows NT, Windows 2000, Windows XP (64-bit) operating systems are not supported

2.2 Supported Communication Interfaces

The following interfaces are supported:

- Keithley Instruments PCI GPIB cards
 - KPCI-488A with driver version 8.3 or higher
 - KPCI-488LPA with driver version 3.12 or higher
- Keithley Instruments USB-to-GPIB adaptors
 - KUSB-488A with driver version 8.3 or higher
 - KUSB-488B with driver version 3.12 or higher

- NI VISA compatible GPIB controllers
- Ethernet
- USB (TMC Protocol)
- RS-232

NOTE: Other than the Keithley Instruments or National Instruments USB-to-GPIB adaptors all other interfaces must be direct interfaces. The Keithley I/O Layer was not tested with USB-RS-232 adaptors or Ethernet-to-GPIB adaptors.

2.3 Supported Virtual Instrument Programming Interfaces (VISA)

The following Virtual Instrument Software Architectures (VISA) are supported:

- National Instruments VISA (NI VISA)

If another version of VISA is already installed, then it may be used, but its performance is not guaranteed.

Other VISAs can also be uninstalled and reinstalled as a secondary VISA, as follows:

1. Uninstall the non-NI VISA software
 - a. Uninstall Tektronix VISA by selecting OpenChoice TekVISA from the Windows Add or Remove Programs wizard (called Programs and Features in Windows 7) list.
 - b. Uninstall Agilent VISA by selecting Agilent I/O Libraries Suite from the Windows Add or Remove Programs wizard (called Programs and Features in Windows 7) list.
 - c. Uninstall other version of VISA by selecting the appropriate entry from the Windows Add or Remove Programs (called Programs and Features in Windows 7) wizard list.
2. Install Keithley I/O Layer
3. If the pre-existing version of VISA was supplied by Tektronix or Agilent, you may safely reinstall that version of VISA once the Keithley I/O Layer software installation is complete. When you reinstall Tektronix or Agilent VISA, it may prompt you to preserve current VISA version, which you should do. This will usually restore the operation of any dependent applications or drivers.
4. If the pre-existing version of VISA was supplied by a vendor other than Tektronix or Agilent, it is recommended that you do not reinstall it as this will likely cause the Keithley I/O Layer software to malfunction.

3 Keithley I/O Layer Installation

3.1 How Do I Install?

Download the Keithley I/O Layer software from the Keithley Web site, www.keithley.com/support. The software is a single compressed file and should be downloaded to a temporary directory.

Run the downloaded file from the temporary directory.

Follow the instructions on the screen to install the software.

The software will install the following components (skipping any that are already installed on your system)::

- NI IVI Compliance Package 4.5
- NI-VISA Runtime 5.2
- Keithley KESCPI IVI Instrument Driver SCPI-856C07
- Keithley I/O Layer KIOL-850C07

When the installation is complete, reboot your computer.

3.2 How Do I Upgrade?

If you have an earlier version of the Keithley I/O Layer software installed on your computer:

1. Uninstall the earlier version of the Keithley I/O Layer by following the listed steps below in the section “How Do I Uninstall?”
2. Install the new version of the Keithley I/O Layer by following the listed steps above in the section “How Do Install?”

3.3 How Do I Uninstall?

If you have an earlier version of the Keithley I/O Layer software installed on your computer, uninstall it by following the steps below before installing this version.

Using the Add/Remove Programs Wizard in Control Panel, uninstall the following components:

- Keithley I/O Layer
- Keithley KESCPI IVI Instrument Driver

Reboot your computer.

3.4 Installation Problems

3.4.1 Manual Install

Should an installation situation occur which causes the installer to fail use the following steps to install one component at a time. Should any errors occur at a specific step and you cannot rectify the problem, contact Keithley Instruments applications support for further assistance.

1. Restart the Keithley I/O Layer installer.
2. Press the Next button and allow the installer to unpack into a temporary directory. Take notice of the directory that the installer unpacks to (e.g. C:\Documents and Settings\FredJones\Local Settings\Temp\nsb123.tmp or C:\Users\FredJones\AppData\Local\Temp\nsnD070.tmp).
3. Cancel the installation by pressing the Don't Accept button.
4. Go to the temporary folder that the software unpacked into. Notated below as <unpackDir>.
5. Install NI IVI Compliance Package (ICP):
Double-click on the file <unpackDir>\Setup\icp450\icp450\setup.exe and allow the installer to run to completion.
6. Install NI-VISA Runtime:
Double-click on the file <unpackDir>\Setup\visa520runtime\visa520runtime\setup.exe and allow the installer to run to completion.
7. Install Keithley KESCPI IVI Instrument Driver:
Double-click on the file <unpackDir>\Setup\SCPI-856C07\kescpi_scpi-856c04.msi and allow the installer to run to completion.
8. Install Keithley I/O Layer:
Double-click on the file <unpackDir>\Setup\KIOL-850C07\keithleyiolayer_kiol-850C07.msi and allow the installer to run to completion.

3.4.2 Resetting Corrupt Keithley Configuration Panel

The following procedure is only to be used as a last resort when the Keithley Configuration Panel will not start, or starts and gives a fatal error, or starts but contains corrupted contents:

****Warning:** This procedure will erase programs that IVI and VISA programs depend on. Reinstallation of associated programs (such as IVI Drivers, LabVIEW, CVI/LabWindows) may be required ******

1. Backup the following files IVIConfigurationStore.xml and .IVIConfigurationStore.xsd, and then delete. (files may be located in C:\Program Files\IVI Foundation\IVI\Data\ or in new location

- C:\Documents and Settings\All Users\Application Data\IVI
Foundation\IVI\
2. Uninstall the following programs
 - a) National Instruments -> NI IVI Compliance Package
 - b) National Instruments -> NI-VISA Runtime
 - c) IVI Shared Components
 - d) VISA Shared Components
 - e) Keithley KESCPI IVI Instrument Driver
 - f) Any other Keithley IVI Instrument Drivers
 - g) Keithley I/O Layer
 3. Reboot System
 4. Delete the C:\Program Files\Keithley Instruments\KeithleyIOLayer directory.
 5. Install the latest version of the Keithley I/O Layer (this will reinstall ICP & VISA)
 6. Reboot System
 7. Open the Keithley Configuration Panel and verify it opens without error.
 8. If no problems, then reinstall IVI Drivers and affected programs.

4 Using the Keithley I/O Layer

4.1 Using the I/O Layer with an Instrument Driver

The Keithley I/O Layer is designed to install and work seamlessly with instrument drivers provided by Keithley Instruments for Keithley's test and measurement equipment. The readme file provided with the instrument driver provides complete details.

4.2 Using the Configuration Panel and Wizard

Launch the Keithley Configuration Panel by selecting the Keithley Configuration Panel shortcut in the Keithley Instruments folder in your program files folder. The Keithley Configuration Panel will open. If the Wizard doesn't start automatically, it may be started from the Help menu. Most common operations can be performed using the Wizard, while the Configuration Panel provides additional capabilities needed for some special situations. Complete instructions for using the Panel and Wizard are available in the online help accessed using the Help menu.

4.3 Using the Keithley Communicator

Launch the Keithley Communicator by selecting the Keithley Communicator shortcut in the Keithley Instruments folder in your program files folder. You may also launch the communicator from within the Keithley Configuration Panel by right clicking on an instrument in the tree pane and selecting "Open".

Refer to the online help for information on using the Keithley Communicator to work with your instrument.

4.4 Firewalls

If you are using VXI-11 or Raw TCP/IP socket communication with your instrument and you are experiencing timeout errors or it just simply doesn't appear to work correctly make sure you have configured your firewall correctly. For Keithley instruments and VXI-11 they use ports 111, 1024 and 1025. The raw socket communication uses port 5025. The Model 2701 and 6221 use port 1394 and don't support VXI-11 so you must use a VISA TCPIP socket resource. For other vendors instruments read their documentation to find out which ports they use and configure them in the firewall appropriately.

5 Known problems and issues

5.1 Keithley Configuration Panel Fatal Error #91 At Start-Up

If you receive an "Object or With block variable not set (Error #91)" error when attempting to run the Keithley Configuration Panel, the IVIConfigurationStore.xml file must be reset. Follow the steps in the section above entitled "Resetting Corrupt Keithley I/O Layer".

6 Improvements and Bug Fixes

6.1 Changes from version B03 to version B04

6.1.1 Fixed to support NI IVI Compliance Package 2.3

Fixed to be compatible with National Instrument's IVI Compliance Package (ICP) version ≥ 2.3 (typically distributed with National Instrument products such as LabVIEW 8, CVI/LabWindows 8, device drivers \geq November 2005). (PR28496)

6.2 Changes from version B04 to version B05

6.2.1 Support for USB Communication Bus Added to Keithley Configuration Panel and Keithley Communicator

New support for communicating with USB Instruments has been added to both the Keithley Configuration Panel's Keithley Configuration Wizard and also the Keithley Communicator.

6.2.2 Now Installs NI-VISA Runtime 4.1 [OBSOLETE]

Now installs new version of NI-VISA Runtime (Version 4.1).

6.2.3 Now Installs INI-XML Converter [OBSOLETE]

Fixes problem where newer systems with IVI Shared Components do not install instrument drivers correctly. By installing the ini to xml converter (converter.exe) with the Keithley I/O Layer, drivers should now correctly appear in the Keithley Configuration Panel's Keithley Configuration Wizard. (PR29627)

6.2.4 IviConfigurationStore.XML Truncation Problem Fixed

Fixes problem with truncation of xml data components when a save file operation was performed within the Keithley Configuration Panel. Although these components are not viewable by the Keithley Configuration Panel itself, they are no longer truncated from the IviConfigurationStore.xml file. (PR29627)

6.3 Changes from version B05 to version B06

6.3.1 Support for Auto-Detection of LXI Instruments Added to Keithley Configuration Panel

New support for discovering and adding LXI Ethernet instruments (VXI-11 discovery) has been added to the Keithley Configuration Panel's Keithley Configuration Wizard.

6.3.2 Support for USB Instruments Added to Keithley Configuration Panel

New support for adding USB Instruments has been added to both the Keithley Configuration Panel's Keithley Configuration Wizard..

6.3.3 Fix for Keithley Communicator Timeout Problems Using Ethernet and Keithley Communicator Not Returning All Characters from a Query

6.4 Changes from version B06 to version B07

6.4.1 Keithley I/O Layer installer upgraded and rewritten to install a set of individual components

The Keithley I/O Layer has changed its installer to install a collection of individual components rather than one bundled software package. The installer will check and then as needed install the individual components (such as NI-Visa Runtime, NI IVI Engine, IVI Compliance Package (ICP), KESCPI Driver, and Keithley I/O Layer). (This new installer has also been upgraded to a new version of InstallShield 2008 [OBSOLETE]).

6.4.2 Now Installs ICP 3.0 [OBSOLETE]

Now installs new version of IVI Compliance Package (ICP) (Version 3.0).

6.4.3 INI-XML Converter Executed at Config. Panel Startup [OBSOLETE]

Upon startup, the Keithley Configuration Panel will perform an INI-XML conversion, if needed, to ensure any newly installed older drivers are properly converted from INI to XML format. Older drivers will now correctly appear in the Keithley Configuration Panel's Keithley Configuration Wizard.

6.4.4 Keithley I/O Layer Suite [OBSOLETE]

The Keithley I/O Layer Suite may be installed on your system by the Keithley I/O Layer installer. If present, this is simply a wrapper that is used to oversee the software installation process and does not contain any significant functionality.

6.5 Changes from version B07 to version C01

6.5.1 Keithley I/O Layer now Vista compatible

The Keithley I/O Layer has been updated to be compatible with Windows Vista.

6.5.2 Fix for Keithley Communicator running slow

Fixes problem with Keithley Communicator running slow after a command is sent. Keithley Communicator performance seems to get worse with further use. (PR36399)

6.5.3 Fix for Keithley Communicator Unable to Save Changes

Fixes problem with Keithley Configuration Panel unable to save changes, also unable to add any new driver models. Previously had to workaroud this by deleting all instruments which had a black drier reference. (PR36089)

6.6 Changes from version C01 to version C02

6.6.1 Now Installs NI-VISA Runtime 4.5.0 [OBSOLETE]

Now installs new version of NI-VISA Runtime (Version 4.5.0).

6.6.2 Now Installs ICP 3.3 [OBSOLETE]

Now installs new version of IVI Compliance Package (ICP) (Version 3.3).

6.7 Changes from version C02 to version C03

6.7.1 Now Installs NI-VISA Runtime 4.6.2 [OBSOLETE]

Now installs new version of NI-VISA Runtime (Version 4.6.2), which officially supports Windows 7.

6.7.2 Now Installs ICP 4.1 [OBSOLETE]

Now installs new version of IVI Compliance Package (ICP) (Version 4.1), which supports 64-bit IVI drivers on 64-bit versions of Windows.

6.7.3 Removed Conversion of IVI Configuration Data from INI Files

If you have configuration data in ivi.ini, it is not accessible to compliant IVI software. You can use the Keithley Configuration Panel to manually enter the data into the IVI Configuration store. Or, simply run the Keithley Configuration Wizard for each instrument that you are currently using.

6.7.4 Removed Monitoring and Restoration of GPIB DLLs

Many IVI drivers can use GPIB to communicate with instruments using GPIB software provided by GPIB hardware vendors. Compatibility issues between different vendors' software have been resolved so the Keithley I/O Layer no longer corrects compatibility issues. If you experience problems using GPIB software, ensure that you are using only current GPIB software from your hardware vendors.

6.8 Changes from version C03 to version C04

6.8.1 Now Supports Microsoft Windows 7

Bundles NI-VISA version that supports Microsoft Windows 7.

6.8.2 Minor bug fixes in Configuration Panel

Fixes minor problems with launching the Keithley Communicator from the Keithley Configuration Panel.

6.8.3 Improved Ease of Use for GPIB Configuration

Keithley Configuration Wizard now indicates which GPIB bus interfaces are detected and selects the first one.

6.8.4 Fix for Retrieving Driver Setup Values using the API

Fixes incorrect parsing of driversetup values that contain semicolons.

6.8.5 Improved Wizard Operation with TSP Instruments

Fixes failure to obtain instrument identification.

6.8.6 Fix for Launching System Information on Windows 7

Fixes command to launch the System Information utility from the Keithley Configuration Panel's About dialog

6.8.7 Improved Error Handling

Adds improved error trapping and logging to Keithley Configuration Panel and Wizard, preventing crashes and aiding in diagnosing configuration errors. The logs are placed in the user's Temp folder and are called KiCfgLib.log and KiCfgWiz.log.

6.9 Changes from version C04 to version C05

6.9.1 Communicator Open Instrument Enhanced

Keithley Communicator Open Instrument dropdown now lists all resources discoverable with VISA.

6.9.2 Enhanced to add TCPIP INSTR

Keithley Configuration Panel Wizard Add LXI Instrument now allows manual entry of TCPIP INSTR address.

6.9.3 Fix for Wizard Add and Test

Fixes problem using the Keithley Configuration Panel Wizard Add and Test functions which failed to match the correct instrument model and driver.

6.9.4 Fix for Wizard Add/Change Serial Setting

Fixes problems associated with Keithley Configuration Panel Wizard Add and Change operations when attempting to change serial settings (e.g. baud rate, flow).

6.9.5 Added limited support for additional VISA implementations

Fixes failure in the Keithley Configuration Library. Allows limited use of the Keithley Configuration Panel and Library.

6.9.6 Removed obsolete IVI configuration

Removed configuration tabs for Setups and Classes which were for NI IVI Engine 1.83.

6.10 Changes from version C05 to version C06

6.10.1 Now Installs NI-VISA Runtime 5.3

Now installs new version of NI-VISA Runtime (Version 5.3).

6.10.2 Now Installs ICP 4.5

Now installs new version of IVI Compliance Package (ICP) (Version 4.5).

6.10.3 No Longer Supports Microsoft Windows 2000

Support for Microsoft Windows 2000 has been discontinued.

6.10.4 Adds Support for Microsoft Windows 8

Support for Microsoft Windows 8 has been added. See System Requirements for supported editions.

Tip: To open an installed shortcut use the Search feature (WinKey+Q, [think 'Query']) and search *Apps* for "Keithley". You can also find some shortcuts on the Start screen.

If you wish to pin items to the taskbar, right click on a search result or on an icon already on the taskbar and click Pin to taskbar.

6.11 Changes from version C06 to version C07

6.11.1 Communicator now doesn't send the command "syst:rem"

The Keithley Communicator was always sending the command "syst:rem" if the SCPI Option to Auto Detect the termination character was set to Auto. This command will now only be sent if the Auto Detect termination character is Auto and it is an RS-232 connection. If you have an instrument that requires this command to communicate send the "syst:rem" command manually.

7 Copyright Notice

The VISA software supplied with the Instrument Driver is Copyright (c) 2001-2013 National Instruments Corporation. All Rights Reserved.

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End of Release notes.