

KEITHLEY

A Tektronix Company

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Instrument Control Software Quick Start Guide

Safety precautions

Observe the following safety precautions before using this product and any associated instrumentation. Although some instruments and accessories would normally be used with nonhazardous voltages, there are situations where hazardous conditions may be present.

This product is intended for use by qualified personnel who recognize shock hazards and are familiar with the safety precautions required to avoid possible injury. Read and follow all installation, operation, and maintenance information carefully before using the product. Refer to the user documentation for complete product specifications.

If the product is used in a manner not specified, the protection provided by the product warranty may be impaired.

The types of product users are:

Responsible body is the individual or group responsible for use and maintenance of equipment, for ensuring that the equipment is operated within its specifications and operating limits, and for ensuring that operators are adequately trained.

Operators use the product for its intended function. They must be trained in electrical safety procedures and proper use of the instrument. They must be protected from electric shock and contact with hazardous live circuits.

Maintenance personnel perform routine procedures on the product to keep it operating properly, for example, setting the line voltage or replacing consumable materials. Maintenance procedures are described in the user documentation. The procedures explicitly state if the operator may perform them. Otherwise, they should be performed only by service personnel.

Service personnel are trained to work on live circuits, perform safe installations, and repair products. Only properly trained service personnel may perform installation and service procedures.

Keithley Instruments products are designed for use with electrical signals that are measurement, control, and data I/O connections, with low transient overvoltages and must not be directly connected to mains voltage or to voltage sources with high transient overvoltages. Measurement Category II (as referenced in IEC 60664) connections require protection for high transient overvoltages often associated with local AC mains connections. Certain Keithley measuring instruments may be connected to mains. These instruments will be marked as category II or higher.

Unless explicitly allowed in the specifications, operating manual, and instrument labels, do not connect any instrument to mains.

Exercise extreme caution when a shock hazard is present. Lethal voltage may be present on cable connector jacks or test fixtures. The American National Standards Institute (ANSI) states that a shock hazard exists when voltage levels greater than 30 V RMS, 42.4 V peak, or 60 V DC are present. A good safety practice is to expect that hazardous voltage is present in any unknown circuit before measuring.

Operators of this product must be protected from electric shock at all times. The responsible body must ensure that operators are prevented access and/or insulated from every connection point. In some cases, connections must be exposed to potential human contact. Product operators in these circumstances must be trained to protect themselves from the risk of electric shock. If the circuit is capable of operating at or above 1000 V, no conductive part of the circuit may be exposed.

Do not connect switching cards directly to unlimited power circuits. They are intended to be used with impedance-limited sources. NEVER connect switching cards directly to AC mains. When connecting sources to switching cards, install protective devices to limit fault current and voltage to the card.

Before operating an instrument, ensure that the line cord is connected to a properly-grounded power receptacle. Inspect the connecting cables, test leads, and jumpers for possible wear, cracks, or breaks before each use.

When installing equipment where access to the main power cord is restricted, such as rack mounting, a separate main input power disconnect device must be provided in close proximity to the equipment and within easy reach of the operator.

For maximum safety, do not touch the product, test cables, or any other instruments while power is applied to the circuit under test. ALWAYS remove power from the entire test system and discharge any capacitors before: connecting or disconnecting cables or jumpers, installing or removing switching cards, or making internal changes, such as installing or removing jumpers.

Do not touch any object that could provide a current path to the common side of the circuit under test or power line (earth) ground. Always make measurements with dry hands while standing on a dry, insulated surface capable of withstanding the voltage being measured.

For safety, instruments and accessories must be used in accordance with the operating instructions. If the instruments or accessories are used in a manner not specified in the operating instructions, the protection provided by the equipment may be impaired.

Do not exceed the maximum signal levels of the instruments and accessories, as defined in the specifications and operating information, and as shown on the instrument or test fixture panels, or switching card.

When fuses are used in a product, replace with the same type and rating for continued protection against fire hazard.

Chassis connections must only be used as shield connections for measuring circuits, NOT as protective earth (safety ground) connections.

If you are using a test fixture, keep the lid closed while power is applied to the device under test. Safe operation requires the use of a lid interlock.



If a screw is present, connect it to protective earth (safety ground) using the wire recommended in the user documentation.



This symbol on an instrument means caution, risk of danger. The user should refer to the operating instructions located in the user documentation in all cases where the symbol is marked on the instrument.



This symbol on an instrument means caution, risk of electric shock. Use standard safety precautions to avoid personal contact with these voltages.



This symbol on an instrument shows that the surface may be hot. Avoid personal contact to prevent burns.



This symbol indicates a connection terminal to the equipment frame.



If the mercury symbol is on a product, it indicates that mercury is present in the display lamp. Please note that the lamp must be properly disposed of according to federal, state, and local laws.

WARNING This heading in the user documentation explains dangers that might result in personal injury or death. Always read the associated information very carefully before performing the indicated procedure.

CAUTION This heading in the user documentation explains hazards that could damage the instrument. Such damage may invalidate the warranty.

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Instrumentation and accessories shall not be connected to humans.

Before performing any maintenance, disconnect the line cord and all test cables.

To maintain protection from electric shock and fire, replacement components in mains circuits — including the power transformer, test leads, and input jacks — must be purchased from Keithley Instruments. Standard fuses with applicable national safety approvals may be used if the rating and type are the same. Other components that are not safety-related may be purchased from other suppliers as long as they are equivalent to the original component (note that selected parts should be purchased only through Keithley Instruments to maintain accuracy and functionality of the product). If you are unsure about the applicability of a replacement component, call a Keithley Instruments office for information.

To clean an instrument, remove power from the instrument. Use a damp cloth or mild, water-based cleaner. Clean the exterior of the instrument only. Do not apply cleaner directly to the instrument or allow liquids to enter or spill on the instrument. Products that consist of a circuit board with no case or chassis (e.g., a data acquisition board for installation into a computer) should never require cleaning if handled according to instructions. If the board becomes contaminated and operation is affected, the board should be returned to the factory for proper cleaning and servicing.

Safety precaution revision as of January 2013.

What is KickStart?

KickStart Instrument Control Software lets you start making measurements in minutes without complex instrument programming. Kickstart allows you to do I-V characterization, data acquisition and logging, and power supply control on a variety of Keithley products. The software controls instruments through any of the standard interfaces: LAN, USB, and GPIB. Data can be displayed in a graph, chart, or both formats. All data can be stored and exported for further analysis in a spreadsheet software such as Microsoft® Excel®.

About the KickStart documentation

This guide contains basic instructions for the KickStart software. A copy of this guide is available by clicking the blue help icon in the upper right corner of the KickStart interface.

Additional user information is available in the KickStart software help files. Each test-type plug-in has a tab with additional information specific to the test type.

Additional information specific to the Keithley instruments that you have is available on the Keithley Instruments website at www.tek.com/keithley.

Contact information

If you have any questions after you review the information in this documentation, please contact your local Keithley Instruments office, sales partner, or distributor. You can also call Keithley Instruments corporate headquarters (toll-free inside the U.S. and Canada only) at 1-800-935-5595, or from outside the U.S. at +1-440-248-0400. For worldwide contact numbers, visit the Keithley Instruments website at www.tek.com/keithley.

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Install and launch the software

You can download the KickStart software from the downloads section of www.tek.com/keithley.

The KickStart software requires the appropriate version of Microsoft .NET Framework. For KickStart version 1.7 and earlier, Microsoft .NET Framework 4.0 is required. For KickStart version 1.8 and later, Microsoft .NET Framework 4.5 is required. The KickStart installer will detect if the appropriate version of Microsoft .NET Framework is not installed and prompt the user to install it if necessary.

To install the KickStart software:

1. Double-click the KickStartSetup.exe file to start the installation.
2. Follow the prompts to complete the installation.

To launch the KickStart software:

From the Start menu, select:



You can also navigate to **All Programs > Keithley Instruments > KickStart > KickStart**.

NOTE

Only connect to instruments using one of the supported interfaces (USB, GPIB, or LAN). KickStart scans these remote interfaces and discovers connected instruments if instruments are configured properly. For more information on how to configure the remote interfaces of instruments, please refer to instrument manuals.

To select the Chinese language option:

1. Click the **Settings** tab.
2. In the **Select Language** menu, select **Chinese**.
3. Restart KickStart software to apply the changes.

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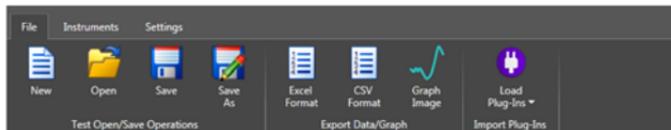
The following topics guide you through the steps to set up a KickStart test.

Step 1: Create a new test project

To use KickStart, you must create a new test project or open an existing test project file, if you have one.

The KickStart software installation includes one or more example projects. These examples are installed on your computer in the My Documents\Keithley Instruments\KickStart folder. This is also the default location for projects that you create.

To create a new test project:



1. Select the **File** tab and click **New**. The Save As dialog box opens.
2. Go to the location where you want to save your test projects.
3. Enter a name for your test.
4. Click **Save**. KickStart creates a new folder with the name of your test project.

NOTE

KickStart test files have a .kst file extension. Creating the test project does not create the .kst file. You must select an instrument and test type before you can save your test to a .kst file.

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To open an existing test project on your computer:

1. From the File tab, click **Open**. The Open dialog box is displayed.
2. Go to the folder that contains the test that you want to open.
3. Select the .kst file.
4. Click **Open**.

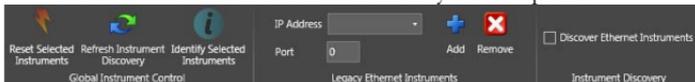
When you create or open a test project, the KickStart interface changes. You can now see large icons at the bottom of the screen that represent the remaining steps to set up and run your test. The following topics describe these steps.



Step 2: Select an instrument

To select an instrument:

1. Click the **Select Instrument** icon. A panel opens that shows the instruments that are connected to your computer.



2. Select the instrument that you want to connect and right-click.
3. Select **Add Instrument**.

NOTE

KickStart searches for compatible instruments connected with GPIB, USB, or LAN interfaces. If you search for the instrument using LAN, the instrument and computer must be on the same network subnet. To remove this option, clear the **Discover LAN Instruments** option. For more information about remote communication interfaces, refer to the Reference Manual for your instrument.

To connect an instrument not shown in the Instrument Configuration Panel:

1. Check the connections to the instrument.
2. Click the **Instruments** on the ribbon.
3. Click **Refresh Instrument Discovery**.

NOTE

Some instruments require you to set the command set to either SCPI or TSP. Check the Read Me file for this requirement.

Step 3: Select the test type

KickStart installs compatible test types for different instruments. You can only select test types that are compatible with the selected instrument. Click the **Select Test Type** icon to open the Test Types panel.

The Communication Terminal is a common test type available to any instrument. You can use this interface to send commands to and view output from the instrument.

NOTE

You can also open the Test Types panel by clicking the Test Types tab on the left side of the interface.

To select the test type:

1. Right-click the test type and select **Add Test Type**. A new tab opens with the name of your test in the upper left part of the KickStart interface.
2. On the ribbon, click **Save**. KickStart saves your test file with a `.kst` extension in the folder that you specified when you created your new test project.

Select your test settings

The settings for your test depend on the test type you are using. For more information about the settings for your test type, open your test and click the **Help** tab in the main test window. For additional information about how to use your instrument, refer to the manuals for your instrument at www.tek.com/keithley.

Step 4: Run the test

Once you have configured your test settings, you are ready to run your test.

1. Click the **Start Test** icon in the lower right corner of the interface.
2. To view the results of the test, click the **Sheet** or **Graph** tab.
3. After running the test, you can customize the graph display.

Select your data view settings

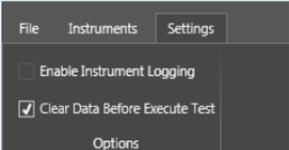
Some of the KickStart test-type plug-ins have options to view and save your test data on the Graph and Sheet tabs in the main test window. The following topics describe these options.

Graph tab

You can plot your data as your test is running and change the settings for the test data to change the view of the graph.

NOTE

Data from your test is saved with the project and remains with the test until you repeat the test. Every time a test is run in the same test project, the previous data is overwritten if the Clear Data Before Execute Test check box is selected on the Settings tab on the ribbon.



The screenshot shows the 'Settings' tab on the ribbon. It contains two checkboxes: 'Enable Instrument Logging' (unchecked) and 'Clear Data Before Execute Test' (checked). Below these is an 'Options' button.

To save the graph to a `.png` file, from the File menu, select the **Graph Image** option.

When you run your test, your data is graphed in real time on the Graph tab. Use your mouse to zoom in or out on the graph view. You can set X-axis and Y1- and Y2-axis settings for measurement

value or time. You can also select linear or logarithmic representation of your data, and you can change the color of graphed lines.

Sheet tab

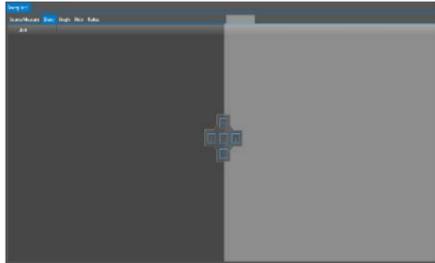
If your test type supports the sheet view, you can see your data in a sheet view after execution of your test. To save the data to an `.xlsx` or `.csv` file format, from the File menu, select the **Excel Format** or **CSV Format** option.

2450 LED demo				
Graph	Sheet	Source Measure	Help	Notes
Item	Smu1.Time[1][1]	Smu1.V[1][1]	Smu1.I[1][1]	
1	0.000000E+000	2.000000E+000	-4.610001E-011	
2	1.171815E-001	2.005000E+000	-4.597212E-011	
3	2.343300E-001	2.010000E+000	-4.129674E-011	
4	3.514905E-001	2.015000E+000	-4.521894E-011	
5	4.686375E-001	2.020000E+000	-4.462208E-011	
6	5.857796E-001	2.025000E+000	-4.769163E-011	
7	7.029156E-001	2.030000E+000	-4.257572E-011	
8	8.200606E-001	2.035000E+000	-4.295941E-011	
9	9.372295E-001	2.040000E+000	-4.021672E-011	
10	1.054364E+000	2.045000E+000	-3.760192E-011	

Customizing the interface

You can customize the appearance of the KickStart interface:

- **Hide or show the ribbon.** Click the arrow in the upper right corner of the ribbon to hide or show it.
- **Display multiple windows in the main test window.** Select a tab and drag it to the graphic in the center of the main test window. The figure below shows the screen as the sheet tab is clicked and dragged to the right side of the window.



NOTE

Changes you make to the layout and views in a project are saved with the project.

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Frequently asked questions

Why am I unable to move to step 2 (selecting a test type) when creating a new test?

When you create a new test in KickStart, you must add the discovered instrument. Right-click the instrument and select **Add Instrument**.

Once you have added an instrument, you can move to step 2, Select Test Type. To select the test type, right-click the test and select **Add Test Type**.

Why are no LAN instruments displayed in the Instrument Configuration window?

There is a check box on the Instrument Settings tab in the ribbon that enables or disables discovery of LAN instruments. Verify that instrument discovery is enabled.

Only the instrument simulators are displayed in the Instrument Configuration panel. Why can't I see my instrument?

Ensure that your instrument is properly connected and configured. Click **Refresh Instrument Discovery** in the Instruments menu. Consult your instrument reference manual for further troubleshooting on connecting to a remote interface.

How do I know which instrument is selected for testing by KickStart?

On the Instruments tab, select the **Identify Selected Instruments** icon. The instrument that is selected for testing displays a message that shows which channel it is set to.

Why is my instrument not communicating with KickStart?

First make sure your instrument model is supported by KickStart. As of KickStart version 1.8, the list of supported instruments is as follows: Keithley Models 2450, 2400, 2280, 2700, 2701, 2750, 2460, DMM7510, and 2461. See the latest version of the KickStart release notes for the latest updates. Second, if you have a Keithley Model 2450, 2460, or 2461, set your instrument to TSP mode.

Next steps

For more information and to view documentation specific to your instrument, see the **Keithley Instruments website**, www.tek.com/keithley.

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Contact information:

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For further information

Tektronix and Keithley maintain a comprehensive, constantly expanding collection of application notes, technical briefs, and other resources to help engineers working on the cutting edge of technology. Please visit www.tek.com/keithley.

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