



## Series 2600 System SourceMeter® Instruments

### v1.4.2 Installation Consideration

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#### Overview:

Version 1.4.2 firmware is an enhancement release that affects both operation and backward compatibility.

Most notable improvements include:

1. Tighter synchronization between channels and multiple units. 1.4.1 offers parallel operation between master and slave nodes. This means that a scripting code can be executed on slave nodes in parallel with codes executing on master and other slave nodes. This change also supports data communication between nodes running in parallel.
2. The Digital I/O trigger timing was enhanced with tighter pulse width controls and additional trigger modes.

Two programming enhancements include:

1. The `printbuffer` command now accepts ordinary tables in the addition to reading buffers
2. A catalog function was added to provide access to the display load-menu contents. The catalog function returns an iterator that can be used with a for loop to iterate over all the entries in the load menu.

Other changes involve improved communication interface handling, access to three TSP-Link Synchronization lines and the ability to change the name of a script after it is loaded. Some front panel operation differences are storage operation and display menu, added SCRIPT option to the LOAD menu and menus re-organized for easier access to the instrument features.

Version 1.4.0 was not released to the general public. Version 1.4.1 firmware was a maintenance release to support hardware changes in production and also was not released to the general public.

#### Supported Models

This firmware is intended for use on the following Keithley Instruments product models:

2601, 2602,  
2611, 2612,  
2635, 2636

#### Compatibility Concerns

Version 1.4.2 firmware introduces changes that may affect compatibility with older firmware. This version of firmware restricts interoperation of direct digital I/O line control (`digio.writebit` and `digio.writeport` commands) and digital I/O triggering. This may introduce compatibility issues with test sequences that intermix direct digital I/O and trigger control on the same digital I/O line. See enhancement PR26312 for more details.

If upgrading from firmware version 1.3.3 or earlier, review the v1.4.0 Release section for more details. Version 1.3.0 firmware also introduced changes that may affect compatibility with older firmware. If upgrading from firmware version 1.2.0 or earlier, review the v1.3.0 Release section for more details (available with 1.3.4 download).

## Models 2601/2602

The following table outlines the considerations that should be made when deciding whether or not to upgrade your Model 2601/2602 firmware to v1.4.2.

Consideration	From v1.1.3 v1.1.4	From v1.3.3	From v1.4.0	From v1.4.1
Recalibration required?	No <sup>1</sup>	No	No	No
Backward compatibility concerns?	Yes <sup>2</sup>	Yes <sup>2</sup>	No	No
Should you upgrade?	Review <sup>3</sup>	Review <sup>3</sup>	Yes	Review <sup>3</sup>

For information about upgrading from a firmware version older than v1.1.3, contact Keithley Instruments customer support or consult the release notes for earlier releases.

## Models 2611/2612

The following table outlines the considerations that should be made when deciding whether or not to upgrade your Model 2611/2612 firmware to v1.4.2.

Consideration	From v1.2.0	From v1.3.3	From v1.4.0	From v1.4.1
Recalibration required?	No <sup>1</sup>	No	No	No
Backward compatibility concerns?	Yes <sup>2</sup>	Yes <sup>2</sup>	No	No
Should you upgrade?	Yes	Review <sup>3</sup>	Yes	Review <sup>3</sup>

## Models 2635/2636

The following table outlines the considerations that should be made when deciding whether or not to upgrade your Model 2635/2636 firmware to v1.4.2.

Consideration	From v1.3.0 v1.3.3	From v1.4.0	From v1.4.1
Recalibration required?	Partial <sup>4</sup>	No	No
Backward compatibility concerns?	Yes <sup>5</sup>	No	No
Should you upgrade?	Review <sup>6</sup>	Yes	Review <sup>6</sup>

<sup>1</sup> Recalibration is not necessary when upgrading to v1.4.2 firmware. However, if the unit is recalibrated after performing the upgrade, a recalibration will be required if the firmware is later downgraded to v1.2.0 or any earlier version.

<sup>2</sup> This version of firmware introduces some changes in behavior compared to older firmware. See the Compatibility Concerns section for more details.

<sup>3</sup> Review the entire list of changes made in all firmware versions between your current version and v1.4.2. Upgrade if any of the fixes or enhancements are desired.

<sup>4</sup> Differences between this version of firmware and version 1.3 firmware may cause a few-hundred fA shift in current measurements. A script included with the firmware should be run one time on the instrument after upgrading the unit. This will adjust the offset calibration to remove this shift. Once this script is run on an instrument, if the instrument is later downgraded to version 1.3 firmware, the script must be run on the instrument again after downgrading the firmware. A full recalibration is not necessary and the instrument does not need to be returned to the factory.

<sup>5</sup> This version of firmware introduces some changes in behavior compared to older firmware. See the Compatibility Concerns section for more details.

<sup>6</sup> Review the entire list of changes made in all firmware versions between your current version and v1.4.2. Upgrade if any of the fixes or enhancements are desired.

When upgrading an instrument to this version of firmware from version 1.3, the instrument may exhibit a few-hundred fA shift in current measurements. The `KIOffsetAdjust` script should be run after upgrading the instrument to adjust the offset and remove the offset shift. A full calibration is not needed and the instrument does not need to be returned to the factory. The script will take approximately one hour to run. It only needs to be run once after upgrading.

To perform the offset adjustment:

1. Short the outputs of each of the SMUs. On a Model 2636, short the outputs independently; do not connect SMU A to SMU B. Shorting the output terminals with a two-wire short is sufficient. Four-wire shorts are not needed.
2. Run the `KIOffsetAdjust` script. Test Script Builder (TSB) can be used to load and run the script on the instrument.
3. Remove the output shorts.
4. The instrument will need one additional hour for temperature stabilization before it meets its rated specifications.

If the instrument's firmware is later downgraded to version 1.3 after the `KIOffsetAdjust` script has been run, the instrument will show a shift in the opposite direction. The script must be run on the instrument again after downgrading the firmware to remove the offset shift.

