



Keithley Instruments

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Version v1.4.1d Firmware Release Notes

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General Information

Supported models

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

2461, 2461-NFP, 2461-RACK, 2461-NFP-RACK

Firmware Upgrade/Downgrade Instructions

NOTE: Do not turn off power or remove the USB flash drive until the upgrade process is complete.

From the front panel:

1. Copy the firmware upgrade file to a USB flash drive. The file is: `ki_2461_v1_4_0d.upg`.
2. Verify that the upgrade file is in the root subdirectory of the flash drive and that it is the only firmware upgrade file in that location. 2461 firmware files end with the file extension `.upg`. (example: `H:\ki_2461_v1_4_0d.upg`)
3. Disconnect any input and output terminals that are attached to the instrument.
4. Turn on instrument power.
5. Insert the flash drive into the USB port on the front panel of the instrument.
6. From the instrument front panel, press the **MENU** key.
7. Under System, select **Manage**.
8. Select the type of upgrade you want to do:
 - To upgrade to a newer version of firmware: Select **Upgrade to New**.
 - To force downgrading to an older version of firmware: Select **Downgrade to Older**.
9. If the instrument is controlled remotely, a message is displayed. Select **Yes** to continue.
10. When the upgrade is complete, reboot the instrument.

NOTE: A message is displayed while the upgrade is in progress.

For additional information about upgrading the firmware, refer to the “How do I Upgrade Firmware?” topic in the “Frequently Asked Questions (FAQs)” section of the Model 2461 Interactive SourceMeter® Instrument Reference Manual (document number: 2461-901-01). This manual is available online at <http://www.keithley.com/support>, Search for “2461 Reference Manual” when you get there.

Upgrade considerations for the Model 2461.

No special considerations at this time.

Version v1.4.1d Release

Overview

Version 1.4.1d is the second official firmware release for the Model 2461. Known Issues, Usage Notes, and Upcoming Enhancements are listed below in this document.

Compatibility concerns

N/A

Critical Fixes

PR57078 Models affected:

All 2461 models

Symptom:

No measurements from analog on power-up; fan ramps to full speed/loud.

Roughly 2 out of every 100 power cycles, no measurements will show up on the front panel and the fan will ramp up to high speed and stay there.

Resolution:

This issue has been resolved. A timing bug in the Analog FPGA was found and corrected.

PR57123 Models affected:

All 2461 models

Symptom:

The digitizer performance slider control currently max's out at 70kS/s.

The digitizer actually supports up to 1,000,000 samples per second.

Resolution:

This issue has been resolved. The digitizer slider presets have been set to 1000, 10000, 25000, 50000, 100000, 500000, and 1000000.

PR57272 Models affected:

All 2461 models

Symptom:

Digitize sweeps are sometimes digitizing too much.

The trigger flow generated by the `smu.source.pulsesweep()` function set up for the digitizer is running throughout the entire sweep, including the overhead and output off at the end. Instead, the digitize blocks should encapsulate only the pulse itself. Starting the digitizer should also set a start group marker in the buffer.

Resolution:

Changes have been made so that now the SmartScale will automatically select TrackGroup for the pulse sweeps, which will effectively lock the view to the last pulse in the train/sweep. To view the entire pulse train/sweep, select X-Axis method "All" from the scale tab.

PR57293 Models affected:

All 2461 models

Symptom:

Digitizer incorrectly reports compliance and output state for sample rates > 100kS/s.

Resolution:

This issue has been resolved..

PR57313 Models affected:

All 2461 models

Symptom:

Sweep functions throw an error when used with a digitize function.

When on a digitize function and the instrument is configured for a sweep operation, the instrument errors when trying to initialize the trigger model since it contains measure block instead of digitize blocks.

Resolution:

This issue has been resolved.

PR57327 Models affected:

All 2461 models

Symptom:

Pulse list API is not enforcing a minimum pulse width of 150us.

Resolution:

This issue has been resolved. The instrument now checks for small pulses and produces the correct error when they are too small.

PR57328 Models affected:

All 2461 models

Symptom:

Sweep List and Pulse List won't run if the Source Config List has only one stored index.

After initiating a trigger model from a pulse or sweep operation with a source config list that contains only 1 index, the user receives error 2709 Block number 5 cannot be reached and the trigger model doesn't execute.

Resolution:

This issue has been resolved.

PR57329 Models affected:

All 2461 models

Symptom:

Creating a Trigger Model for a Pulse List takes nonlinear time depending on stored indexes..

The unit takes a long time or appears to be locked up when processing a pulse sweep list remote command. For 10K index in source configuration list, it seems to take over 15 seconds or so to complete command and if at 100K indexes, it appears locked up and taking minutes to complete.

Resolution:

This issue has been resolved.

PR57335 Models affected:

All 2461 models

Symptom:

Contact Check will fail if preceded by the Measure Resistance Function.

Resolution:

This issue has been resolved.

PR57363 Models affected:

All 2461 models

Symptom:

SweepList and PulseSweepList are not appearing in CreateConfigScript file.

Recalling a setup (SCPI) or saved configuration script (TSP) that was generated after creating a custom source configuration list and using it with a sweep list or pulse sweep list command fails to recall the sweep list configuration correctly. Instead it recalls the list or pulse list sweeps as linear step sweeps.

Resolution:

This issue has been resolved.

PR57502 Models affected:

All 2461 models

Symptom:

On some units, the digitizer stops after taking a large number of readings.

Some units typically run for about 1,000,000 readings before stopping. Measurements can be restarted by clearing the active buffer.

Resolution:

This issue has been resolved.

Enhancements

PR57317 **Models affected:**

All 2461 models

Short Description:

Measure config lists recall 'active' will not give an error when provided bad values and locks up.

Long Description:

Enhancement commands have been added to the TSP and SCPI command sets to allow setting the measure or digitize function and the source function with a single command instead of needing to use two (2) commands.

You would use these new commands to allow the instrument to intermix the settings of the measure/digitize function with the settings of the source function to avoid warnings or maybe errors if done separately while setting them. This new command eliminates the need for you to be concerned if you should send the measure or source function command first. Use the individual commands to query what measure/digitize function and source function are set.

New SCPI command:

```
SYSTem:CONFIgure:FUNCTions "<measure/digitize function>", <source function>
```

valid measure/digitize function parameters for "<measure/digitize function>" are:

```
"VOLTage[:DC]"
"CURRent[:DC]"
"DIGitize:VOLTage"
"DIGitize:CURRent"
```

also accepted but will generate errors since invalid options "NONE" and "RESistance"

valid source function parameters for <source function> are:

```
VOLTage
CURRent
```

New TSP command:

```
smu.setfuncs(<measure/digitize function>, <source function>)
```

valid measure/digitize function parameters for <measure/digitize function> are:

```
smu.FUNC_DC_VOLTAGE  
smu.FUNC_DC_CURRENT  
smu.FUNC_DIGITIZE_VOLTAGE  
smu.FUNC_DIGITIZE_CURRENT
```

also accepted but will generate errors since invalid options

```
smu.FUNC_NONE  
smu.FUNC_RESISTANCE
```

valid source function parameters for <source function> are:

```
smu.FUNC_DC_VOLTAGE  
smu.FUNC_DC_CURRENT
```

PR57303 **Models affected:**
PR57360 All 2461 models
PR57361

Short Description:

Overall Pulse performance has been improved.

Long Description:

The performance of the following behaviors has been improved.

- a) Trigger Stop Block takes a long time when trigger model is running in firmware.
- b) Sometimes, random pulses are not going to their proper bias level.
- c) Sometimes, for pulses with low magnitude, digitizer returns incorrect readings.

Problems with each of these use cases have been repaired and improved.

Noncritical Fixes

PR57315 Models affected:

All 2461 models

Symptom:

Descenders for letter “p” and “mu” are not long enough for certain screens.

A number of tabbed windows throughout the 2461 GUI would sometimes cut off any text that dropped below the line such as lower-case ‘y’ and ‘p’.

Resolution:

This issue has been resolved. The tab control cut off 4 pixels around the circumference of each tabbed window. This 4 pixel frame has been removed and full characters are now visible in all cases.

Known issues

N/A

Version v1.4.0k Release

Overview

Version 1.4.0k is the initial firmware release for the Model 2461. No fixes are listed since this is the very first firmware release. Known Issues, Usage Notes, and Upcoming Enhancements are listed below in this document.

Compatibility concerns

N/A

Critical fixes

N/A

Enhancements

N/A

Noncritical fixes

N/A

Known issues

N/A