KEITHLEY
A Tektronix Company

Series 2600B System SourceMeter® Instruments

Version 3.0.1 Firmware Release Notes

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General Information

Supported models

CAUTION Do not install this firmware on Series 2600 (Models 2601, 2602, 2611, 2612, 2635, 2636), Series 2600A (Models 2601A, 2602A, 2611A, 2612A, 2635A, 2636A), or Series 2650A (Models 2651A, 2657A) instruments.

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

2601B, 2602B, 2604B,
2611B, 2612B, 2614B,
2634B, 2635B, 2636B

Installation instructions

For detailed firmware installation instructions, refer to the "Upgrading the firmware" topic in the "Mainenance" section of the Series 2600B System SourceMeter® Instruments Reference Manual (document number: 2600BS-901-01). This manual is available online at http://www.keithley.com/support. If you decide to upgrade the firmware in your instrument, follow the instructions in the manual. Alternatively, you can arrange to have Keithley Instruments upgrade your firmware at the factory by calling your local Keithley Instruments support office.

Upgrade considerations for all Series 2600B models

The following table lists the considerations that should be made when deciding whether or not to upgrade your Series 2600B instrument firmware to version 3.0.1.

Consideration for upgrade	**From version 3.0.0**
Recalibration required?	No
Backward compatibility concerns?	No
Requalification recommended?	No
Should you upgrade?	Yes

Version 3.0.1 Release

Overview

Version 3.0.1 is a maintenance release of the Series 2600B firmware. This release resolves one critical issue and two noncritical issues.

Critical fixes

PR47324
PR47349

Models affected:

2601B, 2602B, 2604B, 2611B, 2612B, 2614B, 2634B, 2635B, 2636B

Symptom:

When `smuX.source.offmode` = `smuX.OUTPUT_ZERO` and `smuX.source.offfunc` = `smuX.OUTPUT_DCAMPS`, turning the SMU off leaves the hardware in an invalid state. The effective voltage in this state is:

- The value of `smuX.source.levelv` if `smuX.source.func` is set to `smuX.OUTPUT_DCVOLTS`
- The value of `smuX.source.limitv` if `smuX.source.func` is set to `smuX.OUTPUT_DCAMPS`

The effective current limit in this state is unpredictable, but can exceed the standard operating area of the SMU.

Resolution:

This issue has been corrected.

Enhancements

There were no enhancements included in this release. See the “Critical fixes” and “Noncritical fixes” sections for more information about release content.

Noncritical fixes

PR47316
PR47375

Models affected:

2601B, 2602B, 2604B, 2611B, 2612B, 2614B, 2634B, 2635B, 2636B

Symptom:

When setting `smuX.sense` to `smuX.SENSE_CALA`, the effective source range is determined by the `smuX.measure.rangeY` setting instead of the `smuX.source.rangeY` setting. To properly calibrate range R, `smuX.measure.rangeY` must be set to R before setting `smuX.sense` to `smuX.SENSE_CALA`.

Resolution:

This issue has been corrected.

PR47411
PR47412

Models affected:

2601B, 2602B, 2604B, 2611B, 2612B, 2614B, 2634B, 2635B, 2636B

Symptom:

In TSP® Express, running tests with high capacitance mode enabled generates error code 5069, "Autrorange locked for HighC mode," for the following configurations:

- Source voltage, measure voltage
- Source current, measure current
- Source current, measure current and voltage

Resolution:

This issue has been corrected.

Known issues

PR46967 **Models affected:**

2601B, 2602B, 2604B, 2611B, 2612B, 2614B, 2634B, 2635B, 2636B

Symptom:

When the source is off and `smuX.source.offmode` is set to `smuX.OUTPUT_ZERO`, contact check operations will result in error 5066, "source.offlimiti too low for contact check" if the effective current limit is less than 1 mA. In this off mode, `smuX.source.offlimiti` is ignored; instead, the effective current limit is initially determined by either:

- `smuX.source.limiti`, if the channel is sourcing voltage when it is turned off
- the greater of `smuX.source.leveli` or 10% of `smuX.source.rangei`, if the channel is sourcing current when it is turned off

In either case, `smuX.source.limiti`, not `smuX.source.offlimiti`, is used to change the effective current limit when the output is off in `smuX.OUTPUT_ZERO` mode. As such, a more appropriate error would be 5050, "I limit too low for contact check."

PR47029 **Models affected:**

2601B, 2602B, 2604B, 2611B, 2612B, 2614B, 2634B, 2635B, 2636B

Symptom:

When sourcing current, if the combination of `smuX.source.lowrangev` and `smuX.source.rangei` describe a point outside the SMU channel's safe operating area, attempts to change the source configuration erroneously result in error 5007, "Operation would exceed safe operating area of the instrument." Similarly, when sourcing voltage, if the combination of `smuX.source.lowrangei` and `smuX.source.rangev` describe a point outside the SMU channel's safe operating area, attempts to change the source configuration also erroneously result in error 5007. The source lowrange attributes should have no effect when sourcing the opposite function.

Workaround:

The issue can be avoided by lowering the misbehaving lowrange attribute.

PR47032 **Models affected:**

2601B, 2602B, 2604B, 2611B, 2612B, 2614B, 2634B, 2635B, 2636B

Symptom:

When certain errors are generated, the bit set in the Standard Event Status register of the status model does match the bit dictated by the SCPI standard. For example, some errors cause the EXE bit to be set but the SCPI standard dictates that the DDE bit be set for that error.

PR47455 **Models affected:**

2601B, 2602B, 2604B, 2611B, 2612B, 2614B, 2634B, 2635B, 2636B

Symptom:

The `tspnet.tsp.rbtablecopy()` function may return erratic results or make the instrument unresponsive.

PR47459 **Models affected:**

2601B, 2602B, 2604B, 2611B, 2612B, 2614B, 2634B, 2635B, 2636B

Symptom:

The instrument may fail to operate correctly after an "Out of memory" error. The instrument may ignore commands sent over the command interfaces and may ignore front panel operations.

Workaround:

To avoid out-of-memory issues, you should leave 1 MB of dynamic memory available for instrument use. The `meminfo()` function can be used to monitor the actual free memory remaining. When the free memory drops below 1000 KB, the instrument may encounter an "Out of memory" error. The Series 2600B System SourceMeter Instruments Reference Manual explains how to determine the amount of memory needed for reading buffers and sweeps.

PR47460 **Models affected:**

2601B, 2602B, 2611B, 2612B, 2635B, 2636B

Symptom:

In prompting mode, if a `tsplink.reset()` command initiated from another command interface is executing when the instrument receives an abort message, a prompt for the abort message may not be generated. The instrument will abort properly even though the prompt is not generated.

PR47461 **Models affected:**

2601B, 2602B, 2611B, 2612B, 2635B, 2636B

Symptom:

Aborting a `tsplink.reset()` command or aborting a script executing a `tsplink.reset()` command may take a long time because the `tsplink.reset()` command is allowed to complete before execution is aborted. The `tsplink.reset()` command may take several seconds when a large number of nodes are connected together.

PR47463 **Models affected:**

2601B, 2602B, 2604B, 2611B, 2612B, 2614B, 2634B, 2635B, 2636B

Symptom:

The instrument may incorrectly generate an "Out of memory" error when allocating a reading buffer. When there is insufficient memory to allocate the reading buffer, the garbage collector should

automatically run to reclaim any unused memory before generating the “Out of memory” error. The garbage collector often fails to run, and the instrument issues an “Out of memory” error.

Workaround:

To work around this issue, call the `collectgarbage()` function prior to creating a new reading buffer.

PR47478 **Models affected:**

2601B, 2602B, 2604B, 2611B, 2612B, 2614B, 2634B, 2635B, 2636B

Symptom:

Pressing the Recall Buffer button in the virtual front panel when TSP® Express is active will cause the virtual front panel to generate a "Cannot open window:java.lan.Exception: Cannot read from instrument" error.

PR47479 **Models affected:**

2601B, 2602B, 2604B, 2611B, 2612B, 2614B, 2634B, 2635B, 2636B

Symptom:

TSB Embedded does not generate any errors or warnings when TSP® Express is active. The tool appears to work but will not show any saved scripts, nor will it run new scripts.

PR47482 **Models affected:**

2601B, 2602B, 2611B, 2612B, 2635B, 2636B

Symptom:

Executing a `tsplink.reset()` while overlapped measurements are in progress causes the instrument to become unresponsive.

PR47487 **Models affected:**

2601B, 2602B, 2604B, 2611B, 2612B, 2614B, 2634B, 2635B, 2636B

Symptom:

When using TSP-Net, time-outs may occur earlier than programmed. For example, with `tspnet.timeout` set to 5 seconds, the `tspnet.read()` function may actually time out after only 4.7 seconds.

PR47490 **Models affected:**

2601B, 2602B, 2604B, 2611B, 2612B, 2614B, 2634B, 2635B, 2636B

Symptom:

When loading a script using an invalid script name, the instrument loads the script as the anonymous script and does not generate an error.

PR47494 **Models affected:**

2601B, 2602B, 2604B, 2611B, 2612B, 2614B, 2634B, 2635B, 2636B

Symptom:

When nonprintable control codes are embedded in the text passed as parameters to display functions such as `display.settext()`, the control codes cause the display to malfunction. Some of the possible effects are:

- The displayed text is corrupted.
- The instrument beeps or buzzes.
- The display shuts down and displays a "NO COMM LINK" message.