# 2601B-PULSE System SourceMeter Instrument

# Version 1.0.1 Firmware Release Notes

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## CONTENTS

# GENERAL INFORMATION

## SUPPORTED MODELS

This firmware is used on the following Keithley Instruments product models:

- 2601B-PULSE System SourceMeter® Instrument

## INSTALLATION INSTRUCTIONS

For detailed firmware installation instructions, refer to the "Upgrading the firmware" topic in the "Maintenance" section of the *Model 2601B-PULSE System SourceMeter® Instrument Reference Manual* (document number: 2601B-PULSE-901-01). This manual is available online at tek.com/keithley. 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 THE MODEL 2601B-PULSE

The following table outlines the considerations that should be made when deciding whether or not to upgrade your 2601B-PULSE firmware to version 1.0.1.

| Consideration for upgrade | From version 1.0.0 |
|---|---|
| Recalibration Required | No |
| Re-qualification Suggested | No |
| Should you upgrade? | Review[1] |

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[1] Review the list of changes made in this version and all versions in between your current version and this version. Upgrade if any of the fixes or enhancements are desired.

# VERSION 1.0.1 RELEASE

## OVERVIEW

Version 1.0.1 is a maintenance release of the 2601B-PULSE System SourceMeter Instrument firmware. This release includes two critical fixes and two noncritical fixes.

## CRITICAL FIXES

| | |
|---|---|
| **Reference number:** | SLS-189 |
| **Symptom:** | Running a single point sweep or a measure only sweep with the pulser disabled can cause the instrument to become unresponsive. |
| **Resolution:** | This issue has been corrected. |

| | |
|---|---|
| **Reference number:** | SLS-200 |
| **Symptom:** | Running a sweep with the pulser enabled, an arm count greater than 1, and the number of points in the sweep definition not equal to the trigger count may lead to the instrument generating incorrect pulse levels for each iteration through the trigger layer after the first. |
| **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

| | |
|---|---|
| **Reference number:** | SLS-205 |
| **Symptom:** | Pulse mode current sweeps do not allow source values above 10 A. |
| **Resolution:** | The sweep configuration routines now allow up to 10.1 A. Checks for current source values above 10 A with the pulser disabled are deferred until the sweep is initiated. Sweeps with the pulser enabled will allow up to 10.1 A. Sweeps with the pulser disabled will allow only up to 10.0 A. |

| | |
|---|---|
| **Reference number:** | SLS-208 |
| **Symptom:** | Setting the output off mode to ZERO (`smua.OUTPUT_ZERO`) with the pulser enabled will cause the instrument to continuously generate error 5135 when the instrument is in local control with the output off. |
| **Resolution:** | This issue has been corrected. |

**KNOWN ISSUES**

| Reference number: | PR-46967 |
|---|---|
| **Symptom:** | When the source is off and `smua.source.offmode` is set to `smua.OUTPUT_ZERO`, contact check operations will result in an inappropriate error code 5066, "source.offlimiti too low for contact check" if the effective current limit is less than 1 mA. In this off mode, `smua.source.offlimiti` is ignored; instead, the effective current limit is initially determined by either:<br><br>• The value of `smua.source.limiti`, if the channel is sourcing voltage when it is turned off<br>• The greater of `smua.source.leveli` or 10% of `smua.source.rangei`, if the channel is sourcing current when it is turned off<br><br>In either case, `smua.source.limiti`, not `smua.source.offlimiti`, is used to change the effective current limit when the output is off in `smua.OUTPUT_ZERO` mode. As such, a more appropriate error code would be 5050, "I limit too low for contact check." |

| Reference number: | PR-47029 |
|---|---|
| **Symptom:** | The source lowrange attributes should have no effect when sourcing the opposite function. However, when sourcing current, if the combination of `smua.source.lowrangev` and `smua.source.rangei` describes a point outside the SMU channel's safe operating area, attempts to change the source configuration erroneously result in error code 5007, "Operation would exceed safe operating area of the instrument." Similarly, when sourcing voltage, if the combination of `smua.source.lowrangei` and `smua.source.rangev` describes a point outside the SMU channel's safe operating area, attempts to change the source configuration also erroneously result in error code 5007. |
| **Workaround:** | The issue can be avoided by lowering the lowrange attribute. |

| Reference number: | PR-47455 |
|---|---|
| **Symptom:** | The `tspnet.tsp.rbtablecopy()` function may return erratic results or make the instrument unresponsive. |

| Reference number: | PR-47459 |
|---|---|
| **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 *Model 2601B-PULSE System SourceMeter® Instrument Reference Manual* explains how to determine the amount of memory needed for reading buffers and sweeps. |

| Reference number: | PR-47460 |
|---|---|
| **Symptom:** | When prompts are enabled, 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. |

| Reference number: | PR-47461 |
|---|---|
| **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. |

| Reference number: | PR-47463 |
|---|---|
| **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. |

| Reference number: | PR-47482 |
|---|---|
| **Symptom:** | Executing a `tsplink.reset()` while overlapped measurements are in progress causes the instrument to become unresponsive. |

| Reference number: | PR-47487 |
|---|---|
| Symptom: | When using TSP-Net, timeouts 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. |

| Reference number: | PR-47490 |
|---|---|
| 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. |

| Reference number: | PR-47494 |
|---|---|
| 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:<br><br>• The displayed text is corrupted.<br>• The instrument beeps or buzzes.<br>• The display shuts down and displays a "NO COMM LINK" message. |

| Reference number: | PR-53798 |
|---|---|
| Symptom: | The front-panel USB host port becomes non-operational after inserting a flash drive and removing it within a span of approximately 2 seconds. The host port functionality is restored upon rebooting the instrument. |

| Reference number: | PR-57534 |
|---|---|
| Symptom: | LabVIEW sometimes reports a VISA error after a `*CLS` command is sent to the instrument. |

| Reference number: | PR-61713 |
|---|---|
| Symptom: | mDNS does not reliably discover the instrument. |
| Workaround: | To work around this issue, use VXI-11 to discover the instrument. |

| Reference number: | SLS-186 |
|---|---|
| Symptom: | Heavy LAN traffic during a pulser sweep with a high pulse and/or measure rate may cause the sweep to hang. |
| Workaround: | Use a slower pulse period or perform fewer measurements during each pulse. Alternatively, leave the instrument disconnect from the LAN and use one of the other command interfaces to control it. |