Series 2600A System SourceMeter® Instruments
Version 2.2.6 Firmware Release Notes

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Contents

General Information

Supported models

CAUTION	Do not install this firmware on Series 2600 (Models 2601, 2602, 2611, 2612, 2635, 2636), Series 2600B (Models 2601B, 2602B, 2604B, 2611B, 2612B, 2614B, 2634B, 2635B, 2636B), or Series 2650A (Models 2651A, 2657A) instruments.

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

> 2601A, 2602A,
> 2611A, 2612A,
> 2635A, 2636A

Installation instructions

For detailed firmware installation instructions, refer to the "Upgrading the firmware" topic in the "Maintenance" section of the *Series 2600A System SourceMeter® Instruments Reference Manual* (document number: 2600AS-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 2600A models

The following table lists the considerations that should be made when deciding whether to upgrade your Series 2600A instrument firmware to version 2.2.6.

Consideration for upgrade	From versions 2.1.0 2.1.1	From versions 2.1.3 2.1.4 2.1.5 2.1.6	From versions 2.2.1 2.2.2	From version 2.2.3 2.2.4 2.2.5
Recalibration required?	No	No	No	No
Backward compatibility concerns?	No	No	No	No
Requalification recommended?	Yes[1]	No	No	No
Should you upgrade?	Review[2]	Review[2]	Yes	Review[2]

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[1] This release introduces fixes that affect range change delays and can affect tests that are sensitive to settling delays. See the "Compatibility concerns" section for more information.

[2] Review the entire list of changes made in all firmware versions between your current version and version 2.2.6. Upgrade if any of the fixes or enhancements are needed.

Version 2.2.6 Release

Overview

Version 2.2.6 is a maintenance release of the Series 2600A firmware. This release adds one enhancement and fixes one noncritical issue.

Enhancements

PR56231
PR46007

Models affected:

2611A, 2612A, 2635A, 2636A

Enhancement:

Bit 10 of the `status.questionable` register now functions as the HIGHV_NOT_READY bit. When this bit is set, it indicates that either the interlock is not engaged, or that the interlock was engaged recently and the high voltage supply is still stabilizing. If the interlock is engaged and this bit is set, attempting to turn on the output on the 200 V range will result in error code 5052, "Interlock engaged; system stabilizing."

Noncritical fixes

PR48900

Models affected:

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

With open leads, rapidly executed contact check measurements erroneously return a reading of 0 ohms, instead of the expected reading of 9.91E+37.

Resolution:

This issue has been corrected.

Known issues

The Series 2600A has been superseded by the Series 2600B. Maintenance support for the Series 2600A is limited. Although these known issues will not be addressed on the Series 2600A, most of them have been or will be addressed on the Series 2600B.

PR36756
PR37143

Models affected:

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

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

PR36955
PR45600

Models affected:

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

The instrument may generate a fatal error when under heavy LAN packet load. A known situation that causes this is using TSP-Net to send a large number of messages to a remote instrument.

PR38791
PR38792

Models affected:

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

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 2600A System SourceMeter Instruments Reference Manual explains how to determine the amount of memory needed for reading buffers and sweeps.

PR38794

Models affected:

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

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

PR38795

Models affected:

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

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.

PR38800

Models affected:

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

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 an "Out of memory" error is issued.

Workaround:

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

PR39696 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

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.

PR39697 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

TSP® 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.

PR40200 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

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

PR40949 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

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.

PR41548 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

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.

PR42183 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

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.

PR42533 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

The `tspnet.tsp.rbtablecopy()` command generates an error 2413, "TSPnet invalid reading buffer table," if the length of the name parameter exceeds 63 characters.

PR46154 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

If `trigger.timer[`*N*`].delay` is set to a value less than 1 µs, the actual delay that results is approximately 20 µs. Similarly, if `digio.trigger[`*N*`].pulsewidth` or `tsplink.trigger[`*N*`].pulsewidth` is set to a value greater than zero but less than 1 µs, the resulting trigger pulse is approximately 20 µs in width.

PR46306 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

Performing a serial poll using the VXI-11 interface does not clear the status byte's RQS bit as expected.

PR46376 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

When sweeping on a fixed source range, the `smuX.trigger.initiate()` command fails with error 5005, "Value too big for range," if any source point exceeds the range value. For example, a 1.01 mA source point on the 1 mA range. The command should execute without error as long as no source point exceeds 1% beyond the range value.

PR46475 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

If `smuX.measure.autozero` is set to `smuX.AUTOZERO_AUTO`, then executing `smuX.trigger.initiate()` when `smuX.trigger.measure.action` is not equal to `smuX.DISABLE` will cause `smuX.measure.autozero` to be set to `smuX.AUTOZERO_OFF` at the conclusion of the resulting sweep.

PR46480 **Models affected:**
(A)
2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

Sending a properly terminated message using the `device_write()` command causes errors -363, "Input buffer overrun" and -420, "Query UNTERMINATED" when the "end" flag is not set.

PR46480
(B)

Models affected:

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

Performing a `device_read()` operation with an I/O timeout parameter value of zero causes the instrument to reply immediately with an error code of 15 (I/O Timeout).

PR46584   **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

After executing a sweep with source autoranging enabled, if the sweep leaves the SMU on a source range higher than the one it started on, attempting to disable source autoranging using the `smuX.source.autorangeY` attribute fails, generating error 5005 "Value too big for range." Disabling source autoranging by setting the `smuX.source.rangeY` attribute succeeds as expected.

PR47512   **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

Rarely, the instrument boots very slowly, pausing for several minutes with two dots on the front panel display, and requiring more than ten minutes total to complete its boot sequence. Afterward, certain commands malfunction, each requiring more than 30 seconds to execute. These commands include:

```
trigger.timer[N].delay
trigger.timer[N].count
digio.trigger[N].pulsewidth
tsplink.trigger[N].pulsewidth
```

When the instrument is in this state, the functionality of any trigger timer, digital I/O, TSP-Link, or SMU measurement operation cannot be relied upon. Turning the instrument off and then on again corrects the issue.

PR47516   **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

If `smuX.trigger.autoclear` is set to 1, any source trigger that occurs less than 1 μs after the Armed event will be ignored. As such, the source action will not proceed as expected if `smuX.trigger.source.stimulus` is set to `smuX.trigger.ARMED_EVENT_ID`.

Workaround:

Use a timer to add 1 μs of delay between an Armed event and the source stimulus.

PR47518 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

After the smu*X*.sense attribute is changed from smu*X*.SENSE_CALA to either smu*X*.SENSE_LOCAL or smu*X*.SENSE_REMOTE, the actual SMU output level cannot be raised above the programmed level that immediately preceded the sense mode change. Turning the output off when smu*X*.source.offmode is set to smu*X*.OUTPUT_HIGH_Z corrects the issue. Additionally, changing the current source range often corrects the issue.

PR47521 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

If the SMU output is turned off when smu*X*.source.offmode = smu*X*.OUTPUT_NORMAL and smu*X*.source.offfunc = smu*X*.OUTPUT_DCVOLTS, the effective current limit does not correspond to smu*X*.source.offlimiti as it should. When the output is in this state, setting smu*X*.source.offlimiti or smu*X*.source.limiti corrects the issue.

PR47522 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

The VXI-11 interface intermittently terminates response messages too early.

PR48894 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

The SMU output-off limits cannot be accessed from the front panel.

PR48899 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

With open leads, rapidly executed contact check measurements erroneously return 0 ohms, instead of the expected 9.91E+37.

Version 2.2.5 Release

Overview

Version 2.2.5 is a maintenance release of the Series 2600A firmware. This release resolves one critical and several noncritical issues.

Critical fixes

PR47276 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

A voltage measurement triggered within 85 µs of a voltage measurement range change operation may not meet the accuracy specifications of the instrument.

Resolution:

This issue has been corrected.

Noncritical fixes

PR50740 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

When sourcing voltage and measuring current with measure autoranging enabled, if the current flowing through the SMU terminals momentarily exceeds a setpoint of approximately 100 mA, the next reading will occur on the 1 A range or greater, even if a smaller range would be more appropriate for the signal. The autoranging routine resumes its expected behavior on the following reading.

Resolution:

This issue has been corrected.

PR50615 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

In the `KIPulse` factory script, the step size ratio `b` is calculated incorrectly in functions `ConfigPulseIMeasureVSweepLog` and `ConfigPulseVMeasureISweepLog`.

Resolution:

This issue has been corrected.

PR51315 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

Series 2600A web applications (Flash Upgrade, TSB Embedded, Virtual Front Panel, and TSP Express) are blocked from running in Java version 7 update 51 because the JAR file manifest does not contain the Permissions attribute.

Resolution:

This issue has been corrected.

PR51340 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

Series 2600A web applications do not work in Internet Explorer 11. Running any of these web applications brings users to a Keithley support login website.

Resolution:

This issue has been corrected.

PR51344 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

When running a Series 2600A web application, a Java security prompt may ask for your confirmation for running the application. An incorrect application name is shown on the security dialog box.

Resolution:

This issue has been corrected.

PR51348 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

The links to download Java plugin on Series 2600A web applications are broken.

Resolution:

This issue has been corrected.

PR51351 **Models affected:**

2601A, 2602A

Symptom:

Attempting to sweep current using the `smuX.trigger.initiate()` command erroneously fails with error 802, "OUTPUT blocked by interlock", if-and-only-if the voltage limit exceeds 20 V.

Resolution:

This issue has been corrected.

PR51406 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

You may experience inappropriately degraded performance when using ethernet raw sockets and telnet sockets. The degradation may occur when a number of small packets are exchanged across the socket. This is caused by the Nagle algorithm which delays ethernet packets for up to 200 ms when waiting to combine small packets for network efficiency.

In most cases packet immediacy is more desirable than network efficiency. The Nagle algorithm should be disabled by default to eliminate this delay.

Resolution:

The Nagle algorithm is now disabled by default. If necessary for ethernet efficiency, set the `lan.nagle` attribute to `lan.ENABLE` to enable the algorithm.

Version 2.2.4 Release

Overview

Version 2.2.4 is a maintenance release of the Series 2600A firmware. This release resolves several noncritical issues and provides a few enhancements.

Compatibility concerns

Version 2.1.3 introduced two fixes that affect the range-change timing of the source-measure unit (SMU). When upgrading from firmware versions earlier than version 2.1.3, this may affect tests that use low-current ranges and are sensitive to timing. See PR37782 and PR37908 in the "Noncritical fixes" section of the Version 2.1.3 Release for more detail.

Noncritical fixes

PR46131 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

If an End Pulse overrun occurs within 2 μs of a Source overrun, one of the two overruns may not be reported.

Resolution:

This issue has been corrected.

PR46393 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

An Arm or Measure overrun that occurs during a sweep can very rarely cause the instrument to become unresponsive.

Resolution:

This issue has been corrected.

PR48912 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

Rarely, if `smuX.trigger.source.stimulus` is not equal to zero, the resulting sweep may halt unexpectedly before executing the source action.

Resolution:

This issue has been corrected.

PR48939 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

Mounting a USB flash drive during boot operation, or while the instrument is otherwise accessing its nonvolatile memory, can cause the instrument to become unresponsive. Certain flash drives appear to be more susceptible than others.

Resolution:

This issue has been corrected.

PR49236 **Models affected:**

2611A, 2612A, 2635A, 2636A

Symptom:

If smu*X*.source.autorangev is set to 1 and the interlock is not engaged, voltage sweeps that cause the SMU to change to the 200 V source range improperly execute without error. Instead, the execution attempt should fail with error code 802, "OUTPUT blocked by interlock." Note that the SMU output does not actually exceed safe voltage levels when this issue occurs.

Resolution:

This issue has been corrected.

PR49357 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

Very rarely, the completion of a sweep is not managed properly by the SMU. When this issue occurs, the SMU remains in the sweeping state and must be aborted.

Resolution:

This issue has been corrected.

PR49358 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

If smu*X*.trigger.measure.stimulus is nonzero, and smu*X*.trigger.measure.action is set to smu*X*.ENABLED, then measurement overruns are not reported.

Resolution:

This issue has been corrected.

Enhancements

PR48817 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Enhancement:

Keithley has updated its digital signature on all of its Series 2600A Java web applications (TSP Express, TSB Embedded, Flash Upgrade, and Virtual Front Panel) to a stronger 2048-bit certificate.

PR48924 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Enhancement:

Compatibility with USB flash drives has been greatly improved. Many USB flash drive models that the instrument could not previously recognize or access are now fully supported.

PR48940 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Enhancement:

The instrument will respond with error code 1124, "Unrecognized USB device," if an unsupported device (like a mouse) is installed in its front panel USB port.

Similarly, the instrument will respond with error code 1125, "USB overcurrent condition," if the installed USB device trips the instrument's over current protection circuit.

Version 2.2.3 Release

Overview

Version 2.2.3 is a maintenance release of the Series 2600A firmware. This release resolves one critical issue that was introduced in version 2.2.1 and resolves two noncritical issues.

Compatibility concerns

Version 2.1.3 introduced two fixes that affect the range-change timing of the source-measure unit (SMU). When upgrading from firmware versions earlier than version 2.1.3, this may affect tests that use low-current ranges and are sensitive to timing. See PR37782 and PR37908 in the "Noncritical fixes" section of the Version 2.1.3 Release for more detail.

Critical fixes

PR47374   **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

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.

Noncritical fixes

PR47317   **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

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.

PR47416   **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

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.

Version 2.2.2 Release

Overview

Version 2.2.2 is a maintenance release of the Series 2600A firmware. This release resolves one critical issue that was introduced in version 2.2.1, corrects some noncritical issues, and provides a few enhancements.

Compatibility concerns

Version 2.1.3 introduced two fixes that affect the range-change timing of the source-measure unit (SMU). When upgrading from firmware versions earlier than version 2.1.3, this may affect tests that use low-current ranges and are sensitive to timing. See PR37782 and PR37908 in the "Noncritical fixes" section of the Version 2.1.3 Release for more detail.

Critical fixes

PR45674   **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

Loading scripts over a command interface or from a USB flash drive causes a memory leak. Loading several large scripts or many smaller scripts in this manner will eventually result in an error -225, "TSP Memory allocation error: not enough memory" or "Out of memory." Once in this state, you must turn the instrument power off and then back on to recover.

Resolution:

This issue has been corrected.

Enhancements

PR44790 (A)   **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Enhancement:

TSP Express has been enhanced to support composite SMUs in series configurations. When using this configuration, make sure that you connect the SMUs as shown in the connection diagram displayed when using this feature. Also make sure that you follow all safety precautions.

PR44790 (B)   **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Enhancement:

An "Identify" button was added to the TSP Express combining SMU dialog window. Clicking this button will flashes identification message on the front-panel display of individual SMUs that make up the selected composite SMU. At the same time, a connection diagram displays to help you make or verify the necessary connections.

PR44790 (C)   **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Enhancement:

For negative sweeps, TSP Express automatically uses a small negative number (1e-30) very near zero (0) instead of zero to avoid the 100 µs source-polarity change time.

PR44790
(D)

Models affected:

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Enhancement:

TSP Express now rounds source and measure values of composite SMUs to nine decimal places.

PR45053 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Enhancement:

Support was added to the virtual front panel web application for the Model 2651A fast ADC reading buffer status bit. The new column is labeled "FastADC" for instruments that have a fast ADC, and is labeled "Reserved" for those that do not.

Noncritical fixes

PR42741 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

The virtual front-panel web application inappropriately formats some values when displaying reading buffer data. For example, the 200 mV range displays as 0.20000000298023224, instead of 0.2.

Resolution:

This issue has been corrected.

PR44108 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

Setting the current measure range while high-C mode is enabled has no effect.

Resolution:

When high-C mode is enabled, the last value assigned to the current measure range is retained and then used to restore the current measure range when high-C mode is disabled.

PR44631 **Models affected:**
PR45298
2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

When clearing a reading buffer, any errors encountered are repeated nine times.

Resolution:

This issue has been corrected.

PR44965 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

TSP Express does not report instrument errors on its "Script Error" dialog box. The errors display on the "Instrument Output" field, but they are not visible unless the "Edit" tab is selected.

Resolution:

Instrument error messages now display on both the "Script Error" dialog box and the "Instrument Output" field.

PR45106 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

The IDLE event that occurs at the end of a sweep is generated before the SMU hardware has returned to its idle state.

Resolution:

This issue has been corrected.

PR45283 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

If you send a remote command with more than 1024 characters over the LAN socket interface, the instrument attempts to execute the truncated portion of the command message (the portion in excess of 1024 characters). This may or may not result in the instrument generating an error code 285, "TSP Syntax error."

Resolution:

This issue has been corrected.

PR45338 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

The SWEEPING bit in the Operation Status SMU X Summary register (`status.operation.instrument.smuX`) clears before the SMU recognizes that overlapped operation has completed. Consequently, attempting to execute a SMU command immediately after the SWEEPING bit is cleared can result in error code 5042, "Cannot perform requested action while an overlapped operation is in progress."

Resolution:

This issue has been corrected.

PR45363 **Models affected:**

2612A, 2636A

Symptom:

The `status.questionable.unstable_output.SMUB` constant is not defined. This constant should be defined with a value of 4.

Resolution:

This issue has been corrected.

PR45488 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

An incorrect source level is displayed if you abort a fixed-source-range sweep by pressing the EXIT key or the OUTPUT ON/OFF button on the front panel. The actual source level is the programmed idle level, but the display indicates the last level active in the sweep before it was aborted.

Resolution:

This issue has been corrected.

PR45490 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

When a sweep is aborted by a high-priority output off event under certain conditions, the current or voltage source level is incorrectly changed to match the limit value. The table below describes these conditions and the incorrect outcomes:

Condition	Incorrect outcome
Sweep source function = Current and Off function = Voltage	The programmed current source value changes to match the current limit value.
Sweep source function = Voltage and Off function = Current	The programmed voltage source value changes to match the voltage limit value.

The high-priority output off events that can cause this issue include:

- Pressing the OUTPUT ON/OFF button
- Resetting the TSP-Link
- Detecting a SMU over-temperature condition
- Disengaging the interlock

Resolution:

This issue has been corrected.

PR45706 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

A "FATAL ERROR" message may display and the instrument may become unresponsive if you insert or remove a USB flash drive when the instrument is in use.

Resolution:

This issue has been corrected.

Version 2.2.1 Release

Overview

Version 2.2.1 is an enhancement release of the Series 2600A firmware. Several new features have been added to the firmware, in addition to correcting outstanding issues.

Major enhancements

PR38798 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Enhancement:

Each SMU now provides statistical data about the contents of a reading buffer. Statistics for the dedicated reading buffers are now available from the remote interface and the front panel. See the updated user documentation for additional details.

PR39726 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Enhancement:

A new wrap-around mode allows the reading buffers to restart filling the buffer from the beginning when the buffer becomes full. This new feature also provides control over the wrap window size. See the updated user documentation for additional details.

PR42113 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Enhancement:

A power compliance feature has been added. You can set the power compliance limit from a remote interface using the `smuX.source.limitp` attribute. You can also set the power compliance limit from the front panel by pressing **CONFIG**, then selecting **CHANNEL-X** > **LIMIT**, and then selecting **POWER**. Alternatively, you can set the power compliance limit by pressing the **LIMIT** button once to edit the limit, and then pressing it again to toggle between the normal limit value and the power limit.

Other enhancements

PR37083 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Enhancement:

In TSP® Express, project settings information (including sweep/SDM parameters) is now recorded in exported .csv data files.

PR37585 **Models affected:**
PR43939
2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Enhancement:

A "Step-to-Sweep delay" input field has been added to the sweep's main screen to allow a configurable delay to be inserted between an outer step SMU's source complete event and inner

sweep SMUs beginning their sweeps. This can be used to allow devices connected to the outer SMU to settle before starting the inner sweeps.

PR39437   **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Enhancement:

The instrument no longer aborts a running script when the ethernet connection that started the script is lost or closed. Upon loss of connection, the instrument remains in the remote control state (RCS), and the client can reconnect to the instrument and resume getting all output messages.

NOTE	This does not guarantee there will be no data loss. Any data held in the network layers of the previous connection will be lost.

PR40845   **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Enhancement:

The memory usage display on the front panel now displays the memory available and the total memory in kilobytes, rather than as a hexadecimal number.

PR41135   **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Enhancement:

A new feature has been added to the TSP® Express software. For sweep functions, you can create composite SMUs by combining compatible SMUs either in parallel or in series. Once created, you can use the composite SMUs in the same way as actual SMUs within TSP Express. Composite SMUs provide higher current or voltage sourcing capacity than a single SMU. Refer to the TSP Express online help for more details about creating and using composite SMUs.

PR41457   **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Enhancement:

During sweeps, the front-panel display now updates the source and measure values independently. Previously, the source value was updated only when a new measurement value was available.

PR41483   **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Enhancement:

All SMU attributes except `smuX.source.compliance` can now be read during an overlapped SMU operation.

PR41971   **Models affected:**
(A)
2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Enhancement:

TSP Express was enhanced to support the Model 2651A, including support for the Model 2651A high-speed ADC.

PR41971
(B)

Models affected:

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Enhancement:

A new check-box labeled "Connect Data Points" is now available at the bottom of the graph in TSP Express. TSP Express no longer connects the data points with straight lines unless this box is checked.

PR42071 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Enhancement:

When using the instrument front panel to change ranges, the instrument briefly displays the new range setting. When toggling between fixed ranging and autoranging, the instrument briefly displays the range setting or "AUTO."

PR42249 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Enhancement:

TSB Embedded can now import scripts stored on the host computer.

PR42276 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Enhancement:

TSP-Net has been enhanced to filter Telnet escape sequences from the data stream when connecting to a remote node using a Telnet connection.

PR42425 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Enhancement:

Tab stops in the script editor areas of TSB Embedded and TSP Express are now four characters apart.

PR42426 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Enhancement:

A monospace font is now used in the script editor areas of TSB Embedded and TSP Express.

PR42546 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Enhancement:

The TSP Express setup web page now has the same password protection as other applications that are available on the instrument's LXI welcome page.

PR42568 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Enhancement:

Attempting to execute a sweep with a fixed source range and with sweep points that exceed the fixed range now generates a more specific error (error 5005, "Value too big for range") than the more ambiguous error 1101, "Parameter too big."

PR42589 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Enhancement:

Sweep memory management has been improved to allow certain sweep configurations that previously resulted in error -225, "Out of Memory." Specifically, memory consumption now depends on the smaller of the source point count (as defined by calls to $smuX.trigger.source.linearY()$, $smuX.trigger.source.logY()$, or $smuX.trigger.source.listY()$) and the trigger count. Previously, the trigger count had no affect on the memory consumption.

PR42603 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Enhancement:

TSB Embedded now supports using **Ctrl**+**F** as a hot-key combination for bringing up the Find dialog box.

PR42807 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Enhancement:

TSP Express software now uses a more user-friendly data presentation. Instead of using reading buffer names, TSP Express uses user-assigned SMU names (as well as its units) in its table headers, plot X and Y axis labels, and exported .csv files. For example, instead of "Reading (node[5].smua.nvbuffer2)", TSP Express will now show "Gate Reading (Volts)" when $node[5].smua$ is named "Gate" and measures voltage.

PR42990 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Enhancement:

The automatic line frequency detection feature has been improved to more reliably detect the power line frequency in noisy environments.

PR43312 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Enhancement:

For single and multi-SMU sweep tests in TSP Express, the default measure function is now current (the default source function remains voltage). In addition, whenever the source function is changed, TSP Express automatically selects the opposite function for measurement. For example, if you select the current source function, TSP Express will update the measurement function to voltage. If the selected measure function is both current and voltage, the measure function stays the same.

PR43890 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Enhancement:

TSB Embedded now changes the cursor to an hourglass for lengthy operations.

PR43933 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Enhancement:

The instrument displays more dots during its power-up sequence to better show its progress.

PR44033 **Models affected:**
PR44282
2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Enhancement:

The source and measure ranging behavior when the output is off has been optimized to minimize the duration of the output off/on transition.

PR44046 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Enhancement:

Error messages in TSP Express for compliance and trigger overruns now include the node number and model number of the instrument that generated the error condition.

PR44118 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Enhancement:

TSP Express now reports compliance by displaying a "Compliance detected..." button on the toolbar. Clicking this button opens a dialog box with more information about the compliance. The button disappears when the test is run again or the project is closed. This new mechanism for reporting compliance events is less intrusive and allows you to ignore compliance detected messages if you want.

PR44400 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Enhancement:

TSB Embedded now precedes commands typed in the command console command line with "`TSP>`" when echoing the command in the response window to clarify what has been typed versus what has been received from the instrument.

PR44567 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Enhancement:

To better reflect the behavior of the instrument in TSP Express, the measure range is now set to follow the source range when the measure function is the same as the source function.

Noncritical fixes

PR37168 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

The instrument generates a -420, "Query Unterminated" error when it receives a read request from any command interface other than the one currently controlling the instrument. This can result in the test plan detecting errors that it did not cause.

Resolution:

The instrument now suppresses generation of -420, "Query Unterminated" errors when another command interface is actively controlling the instrument.

PR38807 **Models Affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A8807

Symptom:

The `tsplink.reset()` command does not return a prompt if there is a loop in the cascaded TSP-Link® connections between instruments. Also, if the `localnode.showerrors` attribute is set, the error is not immediately reported to the interface.

Resolution:

This issue has been corrected.

PR39084 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

The instrument ignores an `endscript` message if a script is not being downloaded. No errors are generated, and no prompt is generated if prompting is enabled.

Resolution:

The instrument now generates a 2003, "EndScript without LoadScript" error. If prompting is enabled, it now generates a prompt to acknowledge the receipt of the message.

PR39085

Models affected:

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

The instrument ignores an `endflash` message if a firmware flash image is not being downloaded. No errors are generated, and no prompt is generated if prompting is enabled.

Resolution:

The instrument now generates a 2002, "EndFlash without Flash" error. If prompting is enabled, it now generates a prompt to acknowledge the receipt of the message.

PR39086 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

When prompting is turned on and you are downloading a script using the `loadscript` or `loadandrunscript` keyword, or when you are downloading a firmware flash image using the `flash` keyword, the instrument does not generate a prompt for a `*trg` message.

Resolution:

The instrument now generates a prompt for `*trg` messages during script or firmware flash image downloads if prompting is enabled.

PR39378 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

The message for error number 2416 has a typographical error.

Resolution:

This issue has been corrected.

PR39519 **Models affected:**

2602A, 2612A, 2636A

Symptom:

Performing a sweep with measure autoranging turned on for one of the SMUs can interfere with a sweep running on the other SMU.

Resolution:

This issue has been corrected.

PR39693 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

TSP Express does not always show instrument errors in its Error Queue window. It also stays in the Run state and you must press the Abort and Reset buttons to regain control.

Resolution:

This issue has been corrected.

PR39694 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

TSP® Express incorrectly imports a .csv file into a sweep list when the .csv file has blank lines. For each blank line, TSP Express arbitrarily chooses a source level for the step with a blank line.

Resolution:

TSP Express now imports blank lines within the .csv file as 0. It does not import blank lines at end of the .csv file. TSP Express also shows a warning message when any of these conditions are detected.

PR39695 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

The TSP® Express sweep list editor allows importing more than 1000 points, but the points in excess of 1000 are discarded without warning when the list editor is closed.

Resolution:

The TSP Express sweep list editor now generates an Import Warning dialog box indicating that only the first 1000 data points will be imported when the file contains more than 1000 points.

PR39776 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

When the instrument description in the `localnode.description` attribute is blank, TSP Express incorrectly determines the line frequency of the instrument and always uses 60 Hz for all calculations that are line-frequency dependent.

Resolution:

This issue has been corrected.

PR39793 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

Sending a message longer than 1024 bytes to the instrument over a VXI-11 connection may make the instrument unresponsive. PR39160 in version 2.1.4 only partially repaired this issue.

Resolution:

This issue has been corrected.

PR39817

Models affected:

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

Deadlock conditions detected by the VXI-11 interface are not reported to the error queue.

Resolution:

This issue has been corrected.

PR39867 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

Heavy LAN I/O may cause the instrument to stop responding.

Resolution:

This issue has been corrected.

PR39873 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

Neither the `reset()` function, nor the `lan.trigger[N].clear()` function clears the `lan.trigger[N].overrun` indicator.

Resolution:

This issue has been corrected.

PR39875 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

The SMU may return an incorrect measurement when using an aperture greater than 24 NPLC.

Resolution:

This issue has been corrected.

PR39907 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

Interacting with the instrument's web page while the instrument is upgrading its firmware will cause the instrument to halt the firmware upgrade. This can render the instrument unable to power up, which must be repaired at the factory.

Resolution:

The web server is now halted while reprogramming the firmware.

PR39925 **Models affected:**
PR39926
PR39927 2601A, 2602A, 2611A, 2612A, 2635A, 2636A
PR39928
PR39929 **Symptom:**
PR39930
If a certain SMU command is pending when any of the following events occur, the source output may not turn off for several seconds or longer:

- The OUTPUT ON/OFF key is pressed.
- The output enable (Model 2601A/2602A) or interlock (Model 2611A/2612A/2635A/2636A) line is disengaged.
- A SMU over-temperature condition is detected.
- A TSP-Link reset operation is initiated on a remote node.

The delay is dependent on the SMU configuration. During the delay, the SMU OUTPUT ON/OFF LED on the front panel blinks, indicating that the output off event is being processed.

The following SMU commands are vulnerable to this issue:

- smu$X$.source.func
- smu$X$.source.highc
- smu$X$.source.offlimiti
- smu$X$.source.offmode
- smu$X$.source.output
- smu$X$.trigger.initiate()

Resolution:

This issue has been corrected.

PR39931 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

The SMU source and measure delays are enforced when the instrument is in the local control state. When these delays are set to large values, front-panel control is very sluggish and there is no way to change the delay values from the front panel.

Resolution:

The smu$X$.measure.delay and smu$X$.source.delay attributes are now ignored when the instrument is in the local control state (LCS).

PR39948 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

TSB Embedded does not display the contents of autorun scripts.

Resolution:

This issue has been corrected.

PR40188

Models affected:

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

The instrument may generate a fatal error if another node on the TSP-Link network performs a `tsplink.reset()` while the instrument is powering up.

Resolution:

This issue has been corrected.

PR40197 **Models affected:**
PR43004
2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

If a TSP-Link reset operation is performed while a SMU operation is pending on a node in the system, it is possible for that node to become unresponsive. If this happens, you must turn off instrument power and then turn it on again.

Resolution:

This issue has been corrected.

PR40330 **Models affected:**
PR40331
2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

Any abort action that occurs during execution of a `smuX.trigger.initiate()` or `smuX.measure.Y()` command when used with a reading buffer may not be fully processed, requiring a front panel **EXIT** key press to complete. If the abort action was initiated from the front panel by either an **EXIT** key press or an **OUTPUT ON/OFF** button press, the instrument may become unresponsive, requiring the instrument power to be turned off and then on again.

Resolution:

This issue has been corrected.

PR40359 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

Setting the `tsplink.group` attribute does not generate an error when the value is less than zero.

Resolution:

Setting the `tsplink.group` attribute to a value less than zero now generates a -222, "Parameter data out of range" error.

PR40366 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

Aborting a sweep or a nonoverlapped measurement operation may cause the instrument to become unresponsive.

Resolution:

This issue has been corrected.

PR40450 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

After aborting certain measurement operations, attempting to execute another such measurement operation results in the second operation never completing. This occurs only if the second operation is started before the first operation would have completed had it not been aborted. The vulnerable measurement operations are:

- Any smu$X$.measure.Y() command, when the command is executed with a reading buffer parameter and the smu$X$.measure.count attribute is greater than 1.
- Any sweep, when the measure action is enabled, the smu$X$.measure.count attribute is greater than 1, and the abort action occurs during the measure action.

Resolution:

This issue has been corrected.

PR40502 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

When using the instrument over the GPIB interface, switching the instrument from active talker to active listener while there are more responses in the output queue can cause the instrument to operate erratically. When this happens, the instrument may drop a few characters from the incoming command message. In some circumstances it stops responding.

Workaround:

Insert a small delay between addressing the instrument to listen and sending the first character of the message.

Resolution:

This issue has been corrected.

PR40554 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

In the SMU trigger model, the measure action block will not wait for the measure stimulus if the measure action is disabled.

Resolution:

This issue has been corrected.

PR40667 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

If smu*X*.trigger.autoclear is enabled, the measure detector does not clear as expected when the trigger model transitions from the arm layer to the trigger layer.

Resolution:

This issue has been corrected.

PR40675 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

Calling the reset() function in an autorun script generates a -222, "Parameter data out of range" error.

Resolution:

This issue has been corrected.

PR40676 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

Graphs with very small axis values (less than 0.001) are not labeled correctly in TSP Express. Some of the axes are labeled as "0" instead of the correct value in scientific notation (for example, "1.0E-6").

Resolution:

This issue has been corrected.

PR40688 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

When executing the PulseIMeasureV or PulseVMeasureI factory script, setting the bias level to a value that exceeds the source range (which is determined by the pulse level) results in an error.

Resolution:

This issue has been corrected.

PR40689 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

If the reference cache for the specified NPLC is empty and the smu*X*.meaure.autozero attribute is set to smu*X*.AUTOZERO_OFF, attempting to store measurements in a reading buffer using the smu*X*.trigger.initiate() or smu*X*.measure.*Y*() commands results in erroneous readings. All

subsequent readings will be incorrect. To recover, the instrument power must be turned off, and then turned on again.

Resolution:

This issue has been corrected.

PR40745   **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

If an autozero measure operation is performed after a `smuX.trigger.initiate()` command results in error 5039, "Measure count exceeds buffer capacity" or error -225, "Out of memory," but before a `reset()` or `smua.reset()` is executed, all subsequent readings will be erroneous readings.

Resolution:

This issue has been corrected.

PR40965   **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

If a SMU channel is configured as a voltage source with a current limit greater than 100 mA, and current measure autoranging is enabled, the first measurement that occurs after a polarity change may be made on the 1 A range when a lower current measurement range would be more appropriate.

Resolution:

This issue has been corrected.

PR41132   **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

A device configuration error occurs in TSP Express when there are more than six instruments connected in a TSP-Link network.

Resolution:

This issue has been corrected.

PR41134   **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

TSP Express is not able to show more than 10 SMUs on its device configuration window.

Resolution:

This issue has been corrected.

PR41159

Models affected:

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

When sweeping with autoranging enabled, the `smuX.abort()` command may cause the instrument to become unresponsive if the command is executed while a range change is in progress.

Resolution:

This issue has been corrected.

PR41221 **Models affected:**

2611A, 2612A

Symptom:

TSP Express allows entry of invalid current source values when autorange is selected.

Resolution:

This issue has been corrected.

PR41284 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

If the trigger limit (`smuX.trigger.source.limitY`) is smaller than the bias limit (`smuX.source.limitY`), and the range appropriate for the bias limit is larger than the range appropriate for the trigger limit (for example, `smua.source.limiti = 10e-3` and `smua.trigger.source.limiti = 1e-3`), the bias limit used during the sweep will be smaller than desired.

Resolution:

This issue has been corrected.

PR41310 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

During sweeping operations, the limit range is determined by either the normal source limit (`smuX.source.limitY`) or the sweep source limit (`smuX.sweep.source.limitY`), whichever is higher. If the lower of these two settings is less than 10 percent of the limit range, this lower limit may not be enforced properly.

Resolution:

When the effective limit would be below 10 percent of the limit range, the instrument now uses a limit value that is 10 percent of the limit range instead of the requested limit value. This is an inherent limitation of the SMU hardware.

PR41313 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

TSP Express only reports the first voltage/current compliance event on a remote node; any further compliance events on that node are not reported.

Resolution:

This issue has been corrected.

PR41323 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

Output signal glitches may occur shortly before the start of a TSP Express generated sweep.

Resolution:

This issue has been corrected.

PR41439 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

If an operation on a SMU is aborted using a command such as `abort` or `smuX.abort()`, or by using the front-panel EXIT button, a SMU Armed event is generated, but should not have been generated.

Resolution:

This issue has been corrected.

PR41798 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

When attempting to turn the SMU source on when the level and limit settings exceed the standard operating area, the SMU erroneously illuminates the OUTPUT ON/OFF LED, even though it correctly generates an error and does not actually turn the source on. When this occurs, the LED remains illuminated until the SMU output is explicitly turned off.

Resolution:

This issue has been corrected.

PR41912 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

When the front panel is configured for single channel display with the source and measure functions the same, pressing the range up or range down buttons to change the measure range may change the measure range that will be used when the source function is toggled between voltage and current.

Resolution:

This issue has been corrected.

PR41939 **Models affected:**
PR42802
2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

After performing a TSP-Link reset from one node, performing another TSP-Link reset from another node on the network without first running remote commands on that node causes all nodes on the TSP-Link to become unresponsive.

Resolution:

This issue has been corrected.

PR41948 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

When source autoranging is enabled, if the `smuX.source.lowrangeY` attribute is set to a range higher than the active source range, and then source autoranging is disabled, the instrument does not properly track the active source range. In this state, reading the source range does not return the correct value, and the front-panel display does not indicate the correct source range. The issue is resolved by performing a SMU reset operation, explicitly setting the source range, or re-enabling source autoranging.

Resolution:

This issue has been corrected.

PR41950 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

When turning on high-C mode as a voltage source, the current source range is not properly updated to reflect the 1 μA minimum range restriction in this mode. Similarly, when turning on high-C mode as a current source, the current limit is not properly updated to reflect the 1 μA minimum limit restriction. In both cases, the update will occur when the opposite source function is selected.

Resolution:

This issue has been corrected.

PR41967 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

The `errorqueue.next()` command does not return the originating TSP-Link node ID as its fourth return value.

Resolution:

This issue has been corrected.

PR41983

Models affected:

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

Passing a value of the wrong type to any remote command function that expects any of its parameters to be a string, reading buffer, or array may cause a fatal exception.

Resolution:

This issue has been corrected.

PR42077 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

Setting a measure low range to a range higher than the active measure range will cause autorange to be disabled.

Resolution:

This issue has been corrected.

PR42191 **Models affected:**
PR42292
2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

LAN triggers routed back to the instrument (self-triggering) cause two event messages to be logged in the LXI event queue.

Resolution:

This issue has been corrected.

PR42193 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

Accessing a web page while executing a command that saves data to nonvolatile memory will cause the instrument to become unresponsive.

Resolution:

This issue has been corrected.

PR42210 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

TSB Embedded does not warn you when there is an error saving a file, such as when saving a file to a read-only directory.

Resolution:

This issue has been corrected.

PR42247
PR42278

Models affected:

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

When using TSB Embedded, deleting a script deletes the script from nonvolatile memory but does not remove the script from the runtime environment. As a result, you cannot save another script using the same name until the instrument is rebooted or the script is manually removed from the runtime environment.

Resolution:

This issue has been corrected.

PR42265

Models affected:

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

TSB Embedded shows the error "Script null doesn't exist" when you attempt to view or list a script that does not exist in the instrument. It should use the script name entered by the user instead of "null."

Resolution:

This issue has been corrected.

PR42288

Models affected:

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

Errors in exporting a script to a USB flash drive are not always reported by TSB Embedded.

Resolution:

This issue has been corrected.

PR42329

Models affected:

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

The system status registers do not update appropriately if a node is asserting its node bit in one of the system status registers (`status.system.condition`, `status.system2.condition`, `status.system3.condition`, `status.system4.condition`, or `status.system5.condition`), the node number of the node is changed, and a `tsplink.reset()` command is performed.

Resolution:

This issue has been corrected.

PR42387

Models affected:

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

Performing certain source operations with the output off after calling `smuX.reset()` can cause unexpected error messages, for example, "Value too big for range."

Resolution:

This issue has been corrected.

PR42416 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

When executing a sweep, the reported source values for any readings that occur after the first sweep complete event will not be correct when all of the following conditions apply:

- The measure action is enabled.
- Source values are being collected in the reading buffer.
- The arm count is greater than 1.
- The trigger count is greater than the number of points used to define the sweep in the `smuX.trigger.source.linearY()`, `smuX.trigger.source.logY()`, or `smuX.trigger.source.listY()` command.

Resolution:

This issue has been corrected.

PR42417 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

When exporting a script to a USB flash drive using TSB Embedded, if a file with the same name already exists, it is overwritten without warning.

Resolution:

Before overwriting a script, TSB Embedded now opens a dialog box requesting confirmation that the script should be overwritten.

PR42461
PR42902 **Models affected:**

2602A, 2612A, 2636A

Symptom:

The instrument can only save three user setups. After saving three setups, saving setups to any other slot other than the three already saved results in a -225, "Out of Memory" error.

Resolution:

This issue has been corrected.

PR42494

Models affected:

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

TSP Express crashes when graphing "Source Value" versus "Reading" data from two different sweep SMUs as an I-V curve (both "Device Source" and "Device Measure" options selected).

Resolution:

This issue has been corrected.

PR42550 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

In TSB Embedded, sending a command that contains pound symbol (#) characters causes TSB Embedded to stop responding.

Resolution:

This issue has been corrected.

PR42551 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

In TSB Embedded, the "Reset Unit" button should be changed to "Reset," because it will reset not only the master node in a TSP-Link network, but also all other nodes connected to the master node.

Resolution:

This issue has been corrected.

PR42554 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

Executing a `smuX.measureYandstep()` command when the output is off may erroneously result in an error 5005, "Value too big for range."

Resolution:

This issue has been corrected.

PR42562 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

Calling `smuX.measure.Y()` with a reading buffer as the command's argument erroneously sets the `smuX.trigger.measure.action` attribute.

Resolution:

This issue has been corrected.

PR42584   **Models affected:**
PR42591
PR42617   2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

Interacting with the instrument through a remote interface while it is reprogramming the firmware can cause the instrument to stop functioning. If this happens, the instrument must be returned to the factory for repair.

Resolution:

This issue has been corrected.

PR42585   **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

If smu*X*.trigger.measure.*Y*() is used with a dynamically created reading buffer, then all references to that reading buffer are destroyed and the Lua garbage collector is (explicitly or implicitly) invoked before the associated smu*X*.trigger.initiate() is executed, then the smu*X*.trigger.initiate() will cause the instrument to become unresponsive.

Resolution:

When a reading buffer that is being reclaimed by the garbage collector is configured in a sweep, the SMU will reset its sweep measurement configuration.

PR42596   **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

When the smu*X*.source.settling attribute is set to smua.SETTLE_DIRECT_IRANGE, and the source function is changed from voltage to current while the output is on, attempting to set the source current range to a level below the current limit without first explicitly setting the current level causes the instrument to erroneously generate an error 5005, "Value too big for range."

Resolution:

This issue has been corrected.

PR42597   **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

If measure autorange is enabled and a measure operation is aborted while a reading is being acquired on an inappropriate range, the next measure operation will stall. Aborting the stalled operation allows the instrument to recover without further error.

Resolution:

This issue has been corrected.

PR42628 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

The `display.loadmenu.add()` command does not save the menu items to nonvolatile storage.

Resolution:

This issue has been corrected.

PR42631 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

When using the front panel to select a script to load from a subdirectory on a USB flash drive, the instrument becomes unresponsive while backing out of the menu tree to get to the main display.

Resolution:

This issue has been corrected.

PR42638 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

The defined order of the bits in the Operation Status Trigger Blender Overrun register set is reversed. BLND1 corresponds to blender 4, BLND2 corresponds to blender 3, BLND3 corresponds to blender 2, and BLND4 corresponds to blender 1.

Resolution:

This issue has been corrected.

PR42716 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

The `InitiatePulseTestDual()` function allows the same SMU channel to be specified for both pulsing SMUs. However, the same SMU channel cannot be used for two different pulses at the same time. The Series 2600 instruments properly check for this condition and generate an error message, but the Series 2600A instruments do not.

Resolution:

The instrument now generates the same error as the Series 2600 instruments generate.

PR42770 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

When using the front panel to select a firmware image to upgrade from a sub-directory on a USB flash drive, the instrument becomes unresponsive while backing out of the menu tree to get to the main display.

Resolution:

This issue has been corrected.

PR42781 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

Using high-C mode with a current source sweep may cause an erroneous error 5044, "Cannot perform requested operation while current measure autorange is enabled."

Resolution:

This issue has been corrected.

PR42796 **Models affected:**

2602A, 2612A, 2636A

Symptom:

Saving a reading buffer for channel B from the front panel results in a data type error. The reading buffer is not saved.

Resolution:

This issue has been corrected.

PR42831 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

Setting the `smuX.measure.autorangei` attribute does not cause an error when it is set to an invalid value.

Resolution:

Setting the `smuX.measure.autorangei` attribute to an invalid value now results in error -224, "Illegal parameter value."

PR42901 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

The NPLC reference cache does not always replace the correct (least recently used) entry when changing the ADC aperture.

Resolution:

This issue has been corrected.

PR42920   **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

Turning on high-C mode with the output on as a voltage source can cause incorrect compliance limit operation. Turning the output off and then on again corrects the issue.

Resolution:

This issue has been corrected.

PR42994   **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

If a sweep is configured with the measure action disabled, but a measure stimulus is configured (smu*X*.trigger.measure.stimulus is set to a nonzero value) and the configured measure stimulus event occurs simultaneously with a call to smu*X*.trigger.initiate(), an erroneous measurement may be triggered. If this happens, all subsequent attempts to make measurements will fail, resulting in bad measurement data or causing the instrument pause indefinitely. If the instrument pauses indefinitely, an abort command must be sent to recover.

Resolution:

This issue has been corrected.

PR42996   **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

Attempting a contact check measurement with the smu*X*.source.offlimiti attribute set below 1 mA causes an error 5050, "I limit too low for contact check" to be generated. The error is misleading because it implies the source limit is too low, when it is actually the smu*X*.source.offlimiti setting causing the contact check failure.

Resolution:

In this situation, the SMU now generates an error 5066, "source.offlimiti too low for contact check."

PR42998   **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

Attempting to perform a contact check measurement when the instrument is configured as a current source with the output on may cause an error 5050, "I limit too low for contact check" if the source range is lower than 1 mA. The error message is misleading because the source range is causing the contact check failure, not the I limit.

Resolution:

In this situation, the SMU now generates an error 5065, "I range too low for contact check".

PR43003 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

If any of the `smuX.trigger.*.stimulus` attributes are set to an invalid numeric value, an error is correctly generated, but the attribute is still set to the invalid value.

Resolution:

This issue has been corrected.

PR43025 **Models affected:**

2611A, 2612A, 2635A, 2636A

Symptom:

When sourcing current on the 10 A range, the `smuX.measureYandstep()` command allows current levels greater than 1.5 A, which is outside the DC operating area of the instrument.

Resolution:

Attempting to use the `smuX.measureYandstep()` command to source a current level greater than 1.5 A will now result in an error 1101, "Parameter too big."

PR43046 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

Sweeps may exhibit timing anomalies normally associated with measure autoranging if source readback measurements are made and measure autoranging is enabled for that function. Because the readback range is fixed to the source range, actual autoranging does not occur, but the timing of the measurements may still be compromised.

Workaround:

Disabling measure autorange for this function results in more deterministic timing.

Resolution:

This issue has been corrected.

PR43150 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

If the measure stimulus of a SMU occurs while `smuX.trigger.initiate()` is executing, the measurement engine may go into an invalid state. When this occurs, the sweep will not terminate and must be aborted.

Resolution:

This issue has been corrected.

PR43168

Models affected:

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

Rarely, the instrument may fail to start properly when it is turned on. When this occurs, the front panel continues displaying the Keithley model number and does not show the default screen. The instrument will start normally after turning the power off and then turning it on again.

Resolution:

This issue has been corrected.

PR43252 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

A sweep that performs a large number of current measurements using the 100 mA fixed range appears to complete successfully, but leaves the instrument unresponsive to subsequent SMU commands. This condition occurs only when the SMU's NPLC setting is not in the reference cache when the sweep is initiated.

Resolution:

This issue has been corrected.

PR43265 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

When using a display input command with parameters that would place an input area off the edge of the display, the instrument generates an inappropriate -213, "Too much data" error.

Resolution:

The instrument now generates a 1700, "Display area boundary exceeded" error.

PR43291 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

When using TSP Express in Basic SDM mode, voltage limit values are not checked and are not used in the test.

Resolution:

This issue has been corrected.

PR43319 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

If the smu*X*.measure.filter.count attribute is changed when the
smu*X*.measure.filter.type attribute is set to smu*X*.FILTER_MOVING_AVG, the filter will not
function properly until the filter type is changed and the filter count is set again.

Resolution:

This issue has been corrected.

PR43343 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

The minimum off-time between extended operating area (EOA) pulses is calculated based on an on-
time that may be up to 100 μs greater than the actual on-time. As a result, the maximum achievable
duty cycle is smaller than expected.

Resolution:

This issue has been corrected.

PR43357 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

Recalling a user-setup from the front-panel display when the limit setting is displayed in a format for a
higher range may result in a limit value that has less resolution than its original value.

Resolution:

This issue has been corrected.

PR43390 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

When storing measurements to a reading buffer when sweeping or when using the
smu*X*.measure.Y() function, if smu*X*.measure.autozero is set to smu*X*.AUTOZERO_AUTO, the
first reading after the autozero acquisition will not meet the accuracy specifications of the instrument if
it is triggered less than 10 microseconds after the autozero acquisition has completed.

Resolution:

This issue has been corrected.

PR43408 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

Current measurements acquired shortly after changing from a measure range of 1 A or greater to the
100 nA range may be outside of specifications.

Resolution:

A 45 ms delay was added to the measure range change.

PR43412 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

The "DHCP lease lost" LAN fault indicator is cleared when the instrument subsequently obtains a different IP address through DLLA. Rule 8.10 in LXI Standard rev. 1.2 requires the LAN status indicator to remain in the fault state for this particular scenario.

Resolution:

This issue has been corrected.

PR43417 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

Certain measure operations are unexpectedly slow if measure autoranging is enabled. These operations include measuring to a reading buffer using the `smuX.measure.Y()` commands, and measuring during sweeps. The issue occurs when measuring voltage as a current source, and when measuring current near zero (0) on the lowest current range as a voltage source.

Resolution:

This issue has been corrected.

PR43424 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

The `smuX.source.offlimiti` attribute is not stored or recalled when using a saved setup.

Resolution:

This issue has been corrected.

PR43443 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

The `smuX.source.highc` and `smuX.source.sink` attributes are not saved in the saved setups.

Resolution:

These attributes are now saved in the saved setups and restored when the setup is recalled.

PR43650 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

If the measurement filter is enabled with the filter type set to smu*X*.FILTER_REPEAT_AVG, and a measure operation is aborted, the next measure operation may leave the measure engine in a faulty state unless the filter type or filter count is first changed, or the filter is first disabled. Once the measure engine is in this state, all subsequent measurements may produce invalid results, and measure and sweep operations may stall unexpectedly. To recover, the instrument power must be turned off and then turned back on again.

Resolution:

This issue has been corrected.

PR43719 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

When the front panel is set to display 6 1/2 digits, measurements with a nonzero first digit always have zero (0) for the least significant digit.

Resolution:

This issue has been corrected.

PR43786 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

Taking readings when smu*X*.measure.filter.enable is set to 1 and smu*X*.measure.filter.type is set to smu*X*.FILTER_MEDIAN can cause the instrument to become unresponsive. This occurs rarely and is most likely to happen soon after the first use of the median filter after the instrument power is turned on.

Resolution:

This issue has been corrected.

PR43888 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

When using TSB Embedded to delete a script from the instrument, there is no prompt to confirm deletion of the script.

Resolution:

TSB Embedded now presents a confirmation dialog box before deleting a script.

PR43906 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

Disabling high-C mode may inappropriately modify the following attributes:

- `smua.measure.lowrangei`
- `smua.measure.rangei`
- `smua.source.limiti`
- `smua.source.lowrangei`
- `smua.source.rangei`

These settings are recorded when high-C mode is enabled, and the captured values are restored when high-C mode is disabled.

Resolution:

This issue has been corrected.

PR43907   **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

Enabling high-C mode as a voltage source when `smua.source.rangei` is 100 nA puts this setting in an invalid state. The source range is actually 1 µA, but reading `smua.source.rangei` indicates that it is still 100 nA. Changing the source function or explicitly setting `smua.source.rangei` resolves the inconsistency.

Resolution:

This issue has been corrected.

PR43971   **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

The instrument may display the message "FATAL ERROR e60 v18" and become unresponsive when any of the following conditions are true:

- A trigger timer's delay is set to a value greater than 65.535 ms and the trigger timer is reset at the same time as its stimulus occurs.
- The instrument is performing a measurement with a measure interval greater than 65.535 ms and the SMU operation is aborted at the same time as an ADC conversion is triggered.
- A digital I/O pulse width is set to a value greater than 65.535 ms and is reset at the very start of its pulse.

Resolution:

This issue has been corrected.

PR44015   **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

If two SMU source stimulus events or two SMU end-pulse stimulus events occur within 100 ns of each other, the second stimulus event is ignored without any indication.

Resolution:

The second stimulus event now generates an overrun condition.

PR44043 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

TSP Express cannot communicate with the instrument when both of the following are true:

- The `localnode.password` attribute is set to a nonempty string.
- The `localnode.passwordmode` attribute is set to either `localnode.PASSWORD_LAN` or `localnode.PASSWORD_ALL`.

TSP Express is able to communicate with the instrument when `localnode.passwordmode` is set to `localnode.PASSWORD_WEB` (default value).

Resolution:

This issue has been corrected.

PR44055 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

When using multiple SMUs, and two or more SMUs are in compliance, TSP Express only reports compliance on one SMU. The compliance on remaining SMUs may be mistakenly reported on subsequent tests.

Resolution:

TSP Express now reports all SMUs that are in compliance. It also prompts you to check the source limit setting.

PR44066 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

The severity levels of many SMU errors are misleading.

Resolution:

The severity levels of several SMU errors have been reduced. Refer to the updated user documentation for the complete list of errors and severity levels.

PR44144 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

If a sweep or a nonoverlapped measurement to a reading buffer is aborted just as the SMU is adjusting its measure range, and measure autoranging was previously enabled with the measure delay set to a nonzero value, the measurement engine state can become invalid. Once in this state, all subsequent measurements are invalid, and the execution of further SMU commands causes the instrument to become unresponsive. The instrument power must be turned off and turned back on again to recover.

Resolution:

This issue has been corrected.

PR44201 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

Aborting a measurement operation initiated by a sweep or by the smu*X*.measure.*Y*() command can leave the measurement engine in an invalid state if the measure count is greater than one (1) and the specified measure interval is a smaller value than the system can achieve. Once in this state, all further readings are erroneous and subsequent SMU commands may cause the instrument to become unresponsive. The instrument power must be turned off and then turned back on again to recover. Measurements initiated with the smu*X*.measure.overlapped*Y*() command do not cause this issue when aborted.

Resolution:

This issue has been corrected.

PR44264 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

When the smu*X*.source.func attribute is set to smu*X*.OUTPUT_DCAMPS and measurements are being made and stored in a reading buffer with the output off, the buffer will indicate current as the source function.

Resolution:

This issue has been corrected.

PR44296
PR44433

Models affected:

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

When smu*X*.measure.autorange*Y* is set to smu*X*.AUTORANGE_FOLLOW_LIMIT, the *Y* measure range follows the *Y* limit range, even when the source function is set to *Y*. In this situation, the *Y* measure range should follow the *Y* source range.

Workaround:

This issue can be avoided by setting smu*X*.measure.autorange*Y* to smu*X*.AUTORANGE_FOLLOW_LIMIT only when the *Y* limit is active (only when sourcing the complementary function).

Resolution:

This issue has been corrected.

PR44357 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

The syntax coloring of embedded quotes in TSB Embedded is incorrect. An example of an embedded quote is `print('Hello " ')`.

Resolution:

This issue has been corrected.

PR44365 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

Erroneous packets from a DHCP server cause a fatal exception or cause the instrument to become unresponsive. This is known to happen with the DualServer v2.1 DHCP server.

Resolution:

This issue has been corrected.

PR44383 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

If measure autoranging is enabled, attempting to set the measure range to a value below the low range setting causes the measure range to be set to the low range instead.

Resolution:

This issue has been corrected.

PR44434 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

If `smuX.measure.autorangei` is set to `smuX.AUTORANGE_FOLLOW_LIMIT` and the output is off in high-Z mode, the I measure range does not properly follow the I limit range.

Resolution:

This issue has been corrected.

PR44438 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

When `smuX.measure.autorangeY` is set to `smuX.AUTORANGE_FOLLOW_LIMIT`, explicitly setting the measure range does not properly disable the autorange setting.

Workaround:

To ensure proper behavior after using this setting, explicitly set `smuX.measure.autorangeY` to `smuX.AUTORANGE_OFF`.

Resolution:

This issue has been corrected.

PR44632 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

The SMU incorrectly updates its programmed source range and source low-range settings when setting the `smuX.source.lowrangeY` to a value that generates an error.

Resolution:

This issue has been corrected.

PR44649 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

Enabling source autorange when the output is off does not cause the source range to drop to its low range, as would be expected.

Resolution:

This issue has been corrected.

Version 2.1.6 Release

Overview

Version 2.1.6 is a maintenance release of the Series 2600A firmware.

Critical fixes

PR40233
PR41866
PR41932

Models affected:

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

When sweeping, the SMU will return incorrect measurements of the source function if source autoranging is enabled and the source changes ranges during the sweep. The first measurement and all measurements made on the starting source range will be correct. Only measurements made on a different range will be erroneous. Additionally, the measurement range indicated in the reading buffer for erroneous measurements is also incorrect.

Resolution:

This issue has been corrected.

Enhancements

PR40548
PR42284

Models affected:

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Enhancement:

USB flash drive compatibility has been improved.

Noncritical fixes

PR37779
PR41916

Models affected:

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

The instrument updates the wrong bit in the `status.system`, `status.system2`, `status.system3`, `status.system4`, or `status.system5` status register after changing the TSP-Link® node number and performing a TSP-Link reset. The instrument continues to update the bit corresponding to the node number it had when the instrument was turned on.

Resolution:

This issue has been corrected.

PR41897
PR41933

Models affected:

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

If a SMU channel is configured as a voltage source with a current limit greater than 100 mA and current measure autoranging enabled, the first measurement that occurs after a polarity change may be made on the 1 A range when a lower current measurement range would be more appropriate.

Resolution:

This issue has been corrected.

PR41921 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

The System Summary Registers (status.system.condition) do not work reliably. Some bits may become stuck in the set state.

Resolution:

This issue has been corrected.

Version 2.1.5 Release

Overview

Version 2.1.5 is a maintenance release of the Series 2600A firmware.

Critical fixes

PR39869 **Models affected:**
PR40385 2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

If any SMU sourcing command is pending when any of the following events occur, the source output may not turn off as expected:

- The output on/off key is pressed.
- The output enable (2601A/2602A) or interlock (2611A/2612A/2635A/2636A) line is disengaged.
- A "SMU too hot" condition is detected.
- A TSP-Link reset operation is initiated on an external node.

Resolution:

This issue has been corrected.

Enhancements

PR39940 **Models affected:**
PR40398 2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Enhancement:

When the instrument needs to turn the output of a SMU off, but the SMU is busy performing another operation, the output LED on the front panel will now blink until the output has turned off. This might happen in the following situations:

- The output on/off key is pressed.
- The output enable (2601A/2602A) or interlock (2611A/2612A/2635A/2636A) line is disengaged.
- A "SMU too hot" condition is detected.
- A TSP-Link reset operation is initiated on an external node.

Noncritical fixes

PR39582 **Models affected:**
PR40375 2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

When the `io.open()` function fails to open a file, it returns only an error string when it should return `nil` and an error string.

Resolution:

This issue has been corrected.

PR39809 **Models affected:**
PR40207
PR40400 2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

Aborting a sweep may infrequently result in a fatal error message on the front panel or may cause the unit to become unresponsive.

Resolution:

This issue has been corrected.

PR39848 **Models affected:**
PR40380
         2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

If a `smuX.source.func`, `smuX.source.output`, `smuX.source.leveli`, or `smuX.source.levelv` command is executing, any attempt to abort will not complete until the source delay has expired.

Resolution:

This issue has been corrected.

PR39868 **Models affected:**
PR40379
         2601A, 2602A

Symptom:

If the `smua.source.outputenableaction` attribute is set to 1, rapidly disengaging and reengaging the output enable line may cause the unit to become unresponsive, requiring power to be turned off, and then on again to recover.

Resolution:

This issue has been corrected.

PR39884 **Models affected:**
PR40382
         2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

The front-panel output on/off LEDs do not indicate changes in the SMU output until after the source delay has expired.

Resolution:

The LED is now turned on when the output is turned on (before the source delay), and it is turned off after the source delay.

PR39899 **Models affected:**
PR40383
         2611A, 2612A, 2635A, 2636A

Symptom:

When the SMU is configured for the 200 V source range, disengaging the interlock immediately after turning the output on does not result in the output turning off as expected. Instead, the output is limited to a safe voltage, nominally 35 V.

Resolution:

This issue has been corrected.

PR39916 **Models affected:**
PR39985
PR39996 2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

The instrument may generate a fatal error when a trigger is detected at the same time as a `digio.trigger[N].wait()` or `tsplink.trigger[N].wait()` call times out.

Resolution:

This issue has been corrected.

PR40196 **Models affected:**
PR40286 2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

The dedicated reading buffers may become corrupted by reading a buffer attribute after turning the instrument power off, then on again.

Resolution:

This issue has been corrected.

PR40198 **Models affected:**
PR40399 2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

Aborting setting the smu$X$.measure.autozero attribute or aborting a smu$X$.contact.r(), smu$X$.contact.check(), or (if smu$X$.measure.autozero is set to smu$X$.AUTOZERO_AUTO) any smu$X$.measure.Y() function intermittently results in subsequent measurement commands returning erroneous reading data.

Workaround:

Performing a smu$X$.reset() immediately after the abort assures correct behavior.

Resolution:

This issue has been corrected.

PR40215 **Models affected:**
PR40287 2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

The `basetimestamp` attribute of a reading buffer created with the `smuX.makebuffer()` function will be incorrect when the `collecttimestamps` attribute of the buffer is set to 0.

Resolution:

This issue has been corrected.

PR40217
PR40401

Models affected:

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

Aborting a measurement may occasionally cause the unit to become unresponsive.

Resolution:

This issue has been corrected.

Version 2.1.4 Release

Overview

Version 2.1.4 is a maintenance release of the Series 2600A firmware.

Enhancements

PR38762
PR39447
PR39790
PR39826

Models affected:

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Enhancement:

When loading new firmware onto the instrument, the instrument now checks to see if the new firmware is compatible with the hardware before allowing the old firmware to be overwritten.

PR39031
PR40567

Models affected:

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Enhancement:

A "Legacy Mode" setting for the digital I/O was added; access this setting through the instrument front panel. The setting is saved in nonvolatile memory, and the instrument will restart when the setting is changed.

NOTE	Legacy Mode is not recommended for new applications. Consult your local Keithley Instruments applications engineer or contact us by email at applications@keithley.com for benefits before enabling this feature.

PR39481
PR40587

Models affected:

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Enhancement:

TSP® Express software has been enhanced to round down calculated values of aperture (NPLC) and source/measure delays to match the instrument's actual resolution: 0.001 for NPLC and 1 µs for source and measure delays.

PR39643
PR40590

Models affected:

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Enhancement:

The "High-C enable" check box in TSP Express was relabeled as "High-C available" to make it more clear that the check box does not turn on high-capacitance mode, but only makes High-C an available option in the Source Mode selection for each channel. A dialog box (that can be disabled if desired) will also appear when changing the setting in this check box. Similar changes were also made for the Auto-range check box.

PR39796
PR40595

Models affected:

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Enhancement:

TSP Express software has been enhanced to round values for timing information for NPLC, source delay, and measure delay when their values are entered with a precision beyond the instrument's resolution. The values displayed are now the same resolution that the instrument actually uses. For example, NPLC values will now be rounded to three decimal places.

Noncritical fixes

PR38673
PR40562

Models affected:

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

The SNMP definition on the LXI Glossary HTML page is listed twice.

Resolution:

This issue has been corrected.

PR39014
PR40565

Models affected:

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

The SMU will use an incorrect limit value when pulsing negative values while the smu$X$.trigger.limit$Y$ attribute is set to a value other than smu$X$.LIMIT_AUTO.

Resolution:

This issue has been corrected.

PR39113
PR39957

Models affected:

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

Calling the display.menu() function while an error message is displayed, and then pressing the **EXIT** key will cause the unit to become unresponsive.

Resolution:

This issue has been corrected.

PR39160
PR39183

Models affected:

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

Sending a message longer than 1024 bytes to the instrument over a VXI-11 connection will make the instrument unresponsive.

Resolution:

The instrument will now generate a "-363, Input buffer overrun" error in response to an input message that is too long.

PR39185
PR39192

Models affected:

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

The VXI-11 interface generates incorrect query error messages. It generates a -420, "Query Unterminated" error when it should generate a -410, "Query Interrupted" error, and it generates a -410, "Query Interrupted" error when it should generate a -420, "Query Unterminated" error.

Resolution:

This issue has been corrected.

PR39186
PR39189

Models affected:

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

VXI-11 transactions that cause a "Query Unterminated" or a "Query Interrupted" error also cause the VXI-11 transaction to report a VXI-11 timeout. The transaction should not generate a timeout error.

Resolution:

This issue has been corrected.

PR39294
PR39961

Models affected:

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

When passing a reading buffer to the smu$X$.measure.Y() command, the command may stall (requiring an abort action) if these conditions simultaneously exist: Measure autoranging and autozero are disabled, and the measure count is greater than 1.

Resolution:

This issue has been corrected.

PR39394
PR40568

Models affected:

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

Running any of the web applications (TSB Embedded, Virtual Front Panel, Flash Upgrade, or TSP Express) after June 6, 2009 generates a pop-up warning with the following message: "The application's digital signature has an error. Do you want to run the application?"

Resolution:

This issue has been corrected.

PR39400
PR40569

Models affected:

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

None of the web applications (TSB Embedded, Virtual Front Panel, Flash Upgrade, or TSP Express) work in Mozilla Firefox® version 3.0.11. Running any of these web application freezes the browser.

Workaround:

Use Microsoft® Internet Explorer® or an earlier version of Firefox.

Resolution:

This issue has been corrected.

PR39466 **Models affected:**
PR40584
2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

The SMU will ignore the `smuX.measure.delay` value when measuring voltage only.

Workaround:

Measure current and voltage together.

Resolution:

This issue has been corrected.

PR39479 **Models affected:**
PR40585
2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

TSP Express incorrectly determines the line frequency of the instrument and always uses 60 Hz for all calculations that are line-frequency dependent.

Resolution:

This issue has been corrected.

PR39480 **Models affected:**
PR40586
2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

When using TSP Express and specifying short pulse widths, the actual pulse widths generated by the SMU may be up to 25 µs longer than specified.

Workaround:

Reduce the NPLC, source delay, or measure delay setting.

Resolution:

The TSP Express software has been corrected to properly calculate the appropriate NPLC, source delay, and measure delay selections so that the SMU performs at the specified timing.

NOTE   When using a project created by an older version of firmware, the TSP Express software does not automatically check and correct the timing constraints. To update

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these manually, open the timing dialog box and then click OK. Reopen the timing dialog box and verify that any adjustments to the settings are satisfactory.

PR39512
PR39958

Models affected:

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

When sweeping, if the first source action starts immediately after the transition from the arm layer to the trigger layer and the first measurement of the sweep is triggered within 100 μs of the first source complete event (or there is no measure trigger configured), the first measurement of the sweep will be delayed. This may also extend the step width or pulse width of the first step in the sweep.

Resolution:

This issue has been corrected.

PR39513
PR40588

Models affected:

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

The scripts generated by TSP Express set the $smuX.measure.nplc$ attribute after setting the $smuX.measure.autozero$ attribute. The $smuX.measure.nplc$ attribute should be set first.

Resolution:

This issue has been corrected.

PR39635
PR40589

Models affected:

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

When selecting the "Single SMU sweeps and measurements" screen from the start-up screen in the TSP Express software, the source and measure ranges for the bias SMU are set to AUTO, even though the Auto-range check-box is not selected by default.

Resolution:

This issue has been corrected.

PR39705
PR40592

Models affected:

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

Entering an invalid number of points in the sweep list editor of the TSP Express software can make the application unresponsive.

Resolution:

This issue has been corrected.

PR39727
PR39960

Models affected:

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

If the `smuX.arm.count` attribute is set to a value other than 1, the `smuX.measure.Y()` function may corrupt the instrument state, leading to erratic behavior. In this situation, it is possible that the instrument will generate a fatal exception or become unresponsive.

Resolution:

This issue has been corrected.

PR39728
PR39959
PR40593

Models affected:

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

An error number 5042 may be erroneously generated after passing a reading buffer to the `smuX.measure.Y()` function when all of the following conditions are true:

- The append mode setting of the reading buffer is enabled.
- Measure autoranging is disabled.
- Autozero is disabled.

Resolution:

This issue has been corrected.

PR39732
PR39870

Models affected:

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

Executing SMU commands on a remote TSP-Link® node immediately after the system goes from the local control state (LCS) to the remote control state (RCS) when the remote SMU output is on may cause the remote node to stop responding or generate a fatal exception.

Resolution:

This issue has been corrected.

PR39752
PR40594

Models affected:

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

When the measure function selected is "current,voltage," the TSP Express software may generate a script that does not set the measure range correctly. Running the script results in a measurement overflow error.

Resolution:

The TSP Express script generator has been corrected. The first time you load a project created with a previous version of firmware, you must force TSP Express to generate new script code by performing the following procedure:

1. Set the **Meas. Function** to either **current** or **voltage** (not "current,voltage").
2. Next, set the **Meas. Function** back to **current,voltage**.
3. Now, set the **Meas. Range**.

Until this is procedure is completed, TSP Express will continue to use the previous incorrectly-generated script code for that project.

PR39762
PR39763

Models affected:

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

Filling the GPIB input buffer and continuing to send messages while the instrument makes more room in the input buffer can cause the instrument to garble the input messages. This may cause the instrument to start generating syntax errors for all subsequent input messages until a DCL bus command is sent to the instrument.

Resolution:

This issue has been corrected.

PR39784
PR39962

Models affected:

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

If the smu*X*.trigger.source.action attribute is set to smu*X*.DISABLE, subsequent sweeps may intermittently stall after all the associated readings have been collected, requiring an abort action to recover.

Resolution:

This issue has been corrected.

PR39795
PR39963

Models affected:

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

If a reading buffer parameter rb is passed to the smu*X*.measure.*Y*() function where the value of rb.capacity is less than the value of smu*X*.measure.count, the operation will correctly report a "5039, Measure count exceeds buffer capacity" error. However, the asterisk on the display will remain on as if the command had succeeded, and any attempt to abort the unit or the SMU channel will cause the unit to become unresponsive.

Resolution:

This issue has been corrected.

PR39803
PR39806

Models affected:

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

The display.trigger.overrun attribute is set to true when you turn the instrument power on. It is not cleared by the reset() function.

Resolution:

This issue has been corrected.

PR39842   **Models affected:**
PR40596
2611A, 2612A, 2635A, 2636A

Symptom:

TSP Express allows a voltage limit below the minimum value accepted by the instrument. When such a script is executed, the instrument will generate an "1102, Parameter too small" error.

Resolution:

This issue has been corrected.

Version 2.1.3 Release

Overview

Version 2.1.3 is a maintenance release of the Series 2600A firmware.

Compatibility concerns

This firmware release introduced two fixes that affect the range change timing of the source-measure unit (SMU). This may affect tests that use low-current ranges and are sensitive to timing. See PR37782 and PR37908 in the "Noncritical fixes" section for more details.

Noncritical fixes

PR37782
PR40598

Models affected:

2635A, 2636A

Symptom:

While in autorange mode, the first reading after changing to the 100 pA, 1 nA, 10 nA, or 100 nA range may be incorrect (unsettled measurement).

Resolution:

The range change settling delays for these ranges have been increased. The following table lists the additional settling delays.

	Analog filter	
Range	**Enabled**	**Disabled**
100 nA	37 ms	37 ms
10 nA	37 ms	37 ms
1 nA	492 ms	172 ms
100 pA	492 ms	172 ms

PR37908
PR37955
PR40600

Models affected:

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

When performing operations that could involve a measure range change (such as when changing the source function), the SMU may impose unneeded extra settling delays. These delays are most noticeable when the SMU is on one of the low-current ranges.

Resolution:

This issue has been corrected. Due to removal of inappropriate delays, test times may decrease and requalification of tests sensitive to settling delays is recommended.

PR37965
PR40627

Models affected:

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

The instrument does not reliably respond to Address Resolution Protocol (ARP) requests, which can lead to connection failures and to other LXI instruments using the same IP address as the instrument.

Resolution:

This issue has been corrected.

PR37998 **Models affected:**
PR40628
2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

When the SMU must change the source function at the beginning of a sweep (call to smu*X*.trigger.initiate() function), the SMU may generate an output transient at the beginning of the first step or generate an inappropriate "1101, Parameter too big" or "5005, Value too big for range" error message.

Resolution:

This issue has been corrected.

PR38025 **Models affected:**
PR38351
PR40601 2602A, 2612A, 2636A

Symptom:

If both SMUs are performing a sweep, aborting the sweep on one SMU with the smu*X*.abort() command will correctly abort the sweep operation on the target SMU, but will also halt the sweep on the other SMU. The halted SMU will remain in its sweeping state, but will not make progress on the sweep. It will remain in this state until it is also aborted.

Resolution:

This issue has been corrected.

PR38044 **Models affected:**
PR40602
2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

Resistance measurements that are 100 kΩ and higher are always displayed on the front panel as zero.

Resolution:

This issue has been corrected.

PR38552 **Models affected:**
PR40604
2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

Stored current measurements that were made on the 10 A range are always displayed as an overflow indication when recalled on the front panel.

Resolution:

This issue has been corrected.

PR38713

Models Affected:

2601A, 2602A, 2611A, 2612A, 2635A, 2636A8807

Symptom:

When running custom sweeps in TSP Express with a large number of points, the instrument reports an error -363, "Input buffer overrun."

Resolution:

This issue has been corrected.

PR38845
PR40597

Models affected:

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

Changing the voltage source level from a more negative value to a less negative value with source autorange enabled could result in an overshoot on the output if the source range changes.

Resolution:

This issue has been corrected.

Version 2.1.1 Release

Overview

Version 2.1.1 is a maintenance release of the Series 2600A firmware.

Enhancements

PR37111 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Enhancement:

A new "current,voltage" measurement option that measures current and voltage simultaneously has been added to TSP Express in the measurement function list box within the sweep module for all channel types (bias, step, and sweep).

PR37268 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Enhancement:

Data can now be imported for a TSP Express custom list sweep. In the sweep module, clicking the "Edit" button opens the Sweep List dialog box. From the Sweep List dialog box, clicking the "Import" button opens a file dialog box from which custom sweep list data can be imported.

Additional information about how to use this feature is provided within the embedded help documentation.

PR37173
PR40629 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Enhancement:

The TSP Express software was enhanced to support full-screen graphing. In the data module, a new check box labeled "Maximize" has been added next to the "Export" button. When the check box is selected, the graph is expanded to fill the window under the Data tab. This option will also expand the table view when the display type is set to "Table" instead of "Graph."

PR37658
PR40609 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Enhancement:

Enhanced the digital I/O trigger control to perform a glitch free mode change when changing the trigger mode during an active trigger pulse.

Noncritical fixes

PR37549
PR40605 **Models affected:**

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

TSP Express displays incorrect scale values in the data module graph after the window is resized.

Resolution:

This issue has been corrected.

PR37579
PR40606

Models affected:

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

When TSP Express saves data to a .csv file, there is an odd character in place of the number of readings.

Resolution:

This issue has been corrected.

PR37591
PR40608

Models affected:

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

If the output enable on a Model 2601A or 2602A, or the hardware interlock on a Model 2611A, 2612A, 2635A, or 2636A is engaged while powering up, the corresponding bit (B11, OE) in the `status.measurement.condition` register is not set as expected. The bit will not be set until the output enable/interlock is disengaged and then re-engaged.

Resolution:

This issue has been corrected.

PR37677
PR40630

Models affected:

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

TSP Express ignores all of the measurement delay settings for the Models 2601A, 2602A, 2611A, and 2612A. It uses them incorrectly for the Models 2635A and 2636A.

Resolution:

This issue has been corrected.

PR37678
PR40612

Models affected:

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

Cannot save scripts with a one-character name from the front panel.

Resolution:

This issue has been corrected.

PR37694
PR40610

Models affected:

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

The instrument may incorrectly identify sweep conditions on the edge of the standard operating area (SOA) as outside the SOA.

Resolution:

This issue has been corrected.

PR37851
PR40631

Models affected:

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

When using TSP Express on a PC with a localization that uses commas in numbers, the numbers are not interpreted correctly by TSP Express or the TSP scripting engine.

Resolution:

TSP Express now always uses the American localization.

PR37862
PR40611

Models affected:

2601A, 2602A, 2611A, 2612A, 2635A, 2636A

Symptom:

When performing a sweep or `smuX.measure.Y()` call lasting more than 30 seconds with a fixed measure range and `smuX.measure.autozero` set to `smuX.AUTOZERO_AUTO`, the operation may not terminate. Subsequently, the unit becomes unresponsive requiring a power cycle.

Resolution:

This issue has been corrected.