



A Tektronix Company

Model 2110 5½ Digit Multimeter

Version 2.03-03-20 Firmware Release Notes

Keithley Instruments
28775 Aurora Road
Cleveland, Ohio 44139
1-800-935-5595
tek.com/keithley

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General Information

Supported model

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

Model 2110

Installation instructions

Firmware installation instructions for the Model 2110 are included with the firmware zip file. The latest firmware can be downloaded from the [Keithley Instruments website \(tek.com/keithley\)](http://tek.com/keithley).

Upgrade considerations for Model 2110

The following table outlines the considerations that should be made when deciding whether or not to upgrade your Model 2110 firmware to version 2.03-02-01.

Consideration for upgrade	From version 1.01	From version 1.02	From version 2.00-01-00	From version 2.00-01-01	From version 2.01-02-01	From version 2.02-02-01
Recalibration Required	No	No	No	No	No	No
Re-qualification Suggested	Yes	No	No	No	No	No
Should you upgrade?	No	No	Yes	Yes	Review ¹	No

¹ Review the list of changes made in this version and all versions in between your present version and this version. Upgrade if any of the fixes or enhancements are needed.

Version 2.03-03-20 Release

Overview

Version 2.03-03-20 is a maintenance release of the Model 2110 firmware. This release adds support for new hardware modifications. Note: if the instrument contains an older revision of display hardware, the instrument will report firmware version 2.03-03-01.

Critical fixes

There were no critical fixes.

Enhancements

Models affected:

2110

Enhancement:

This firmware revision adds support for new hardware while maintaining support for older hardware revisions.

Non-critical fixes

There were no non-critical fixes.

Known issues

PR50384 Models affected:

2110

Symptom:

The SRE register is saved to nonvolatile storage when PSC transitions from 1 to 0, but the nonvolatile copy is not updated when SRE bits are changed while PSC is 0.

Workaround:

To ensure that changes to the SRE register will be saved after a power cycle, toggle PSC after modifying SRE. For example: *SRE 32;*PSC 1;*PSC 0.

Version 2.02-02-01 Release

Overview

Version 2.02-02-01 is a maintenance release of the Model 2110 firmware. This release resolves one critical fix and adds some enhancements involving calibration. It does not require hardware modification or recalibration.

Critical fixes

Models affected:

2110

Symptom:

The "CAL:DATE" command caused the CAL COUNT to return to zero.

Resolution:

This issue has been corrected.

Enhancements

Models affected:

2110

Enhancement:

A new option "CALIBRATION" was added to the Main Menu, under that are the options "CAL COUNT" and "CAL DATE". Selecting either of those options let you see, but not change, the value.

Enhancement:

The "CAL:PROT:SAVE" command causes the CAL COUNT to increment.

Non-critical fixes

There were no non-critical fixes.

Known issues

PR50384 Models affected:

2110

Symptom:

The SRE register is saved to nonvolatile storage when PSC transitions from 1 to 0, but the nonvolatile copy is not updated when SRE bits are changed while PSC is 0.

Workaround:

To ensure that changes to the SRE register will be saved after a power cycle, toggle PSC after modifying SRE. For example: *SRE 32;*PSC 1;*PSC 0.

Version 2.01-02-01 Release

Overview

Version 2.01-02-01 is a maintenance release of the Model 2110 firmware. This release resolves one critical issue and does not require hardware modification or recalibration.

Known issues

PR50384 **Models affected:**

2110

Symptom:

The SRE register is saved to nonvolatile storage when PSC transitions from 1 to 0, but the nonvolatile copy is not updated when SRE bits are changed while PSC is 0.

Workaround:

To ensure that changes to the SRE register will be saved after a power cycle, toggle PSC after modifying SRE. For example: *SRE 32;*PSC 1;*PSC 0.

Version 2.00-01-01 Release

Overview

Version 2.00-01-01 is a maintenance release of the Model 2110 firmware. This release resolves one non-critical issue and does not require hardware modification or recalibration.

Enhancements

There are no enhancements included in this release.

Non-critical fixes

PR47834 Models affected:

2110

Symptom:

On some Model 2110 DMMs, one digit on the front panel display blinks constantly when automatic triggering is enabled.

Resolution:

This issue has been corrected.

Known issues

PR50384 Models affected:

2110

Symptom:

The SRE register is saved to nonvolatile storage when PSC transitions from 1 to 0, but the nonvolatile copy is not updated when SRE bits are changed while PSC is 0.

Workaround:

To ensure that changes to the SRE register will be saved after a power cycle, toggle PSC after modifying SRE. For example: *SRE 32;*PSC 1;*PSC 0.

Version 2.00-01-00 Release

Overview

Version 2.00-01-00 is a maintenance release of the Model 2110 firmware. This release resolves one critical issue and does not require hardware modification or recalibration.

Critical fixes

PR47714 Models affected:

2110

Symptom:

When the ACV range is set for 750V, issuing a :SENS:VOLT:AC:RANGE? SCPI query will return +1.000000E+03

Resolution:

This issue has been corrected.

Enhancements

There are no enhancements included in this release.

Non-critical fixes

PR47834 Models affected:

2110

Symptom:

In TEMP mode, the NTCT sensor coefficients cannot be set or queried via SCPI.

Resolution:

This issue has been corrected. Information on the new commands is available in the updated reference manual, which can be downloaded from the Keithley website.

Known issues

PR50384 Models affected:

2110

Symptom:

The SRE register is saved to nonvolatile storage when PSC transitions from 1 to 0, but the nonvolatile copy is not updated when SRE bits are changed while PSC is 0.

Workaround:

To ensure that changes to the SRE register will be saved after a power cycle, toggle PSC after modifying SRE. For example: *SRE 32;*PSC 1;*PSC 0.

Version 1.02 Release

Overview

Version 1.02 is a maintenance release of the Model 2110 firmware. This release resolves one critical issue and does not require hardware modification or recalibration. ACV and ACI measurements made with the REPEAT AVG digital filter enabled will take longer than with the 1.01 firmware. The increase in measurement time will be approximately $(N-1) \times [\text{trigger delay}]$, where N is the value of the READINGS setting. Note that when the trigger delay is set to AUTO, the AC BANDWIDTH setting will affect the trigger delay time.

Critical fixes

PR46526 **Models affected:**

2110

Symptom:

When the REPEAT AVG digital filter is used with the ACV or ACI functions, the trigger delay setting is ignored after the first reading in the N-reading average. The remaining N-1 readings are taken at one millisecond intervals, severely limiting the effectiveness of the AC REPEAT AVG filter.

Resolution:

This issue has been corrected.

Enhancements

There are no enhancements included in this release.

Non-critical fixes

PR47931 **Models affected:**

2110

Symptom:

When SAMP:COUNT is 1 and TRIG:COUNT is greater than 1, issuing an INIT;:FETC? SCPI query will cause the measurements to be delimited with semicolons instead of commas.

Resolution:

This issue has been corrected.

Known issues

PR47714 Models affected:

2110

Symptom:

When the ACV range is set for 750V, issuing a :SENS:VOLT:AC:RANGE? SCPI query will return +1.000000E+03

PR50384 Models affected:

2110

Symptom:

The SRE register is saved to nonvolatile storage when PSC transitions from 1 to 0, but the nonvolatile copy is not updated when SRE bits are changed while PSC is 0.

Workaround:

To ensure that changes to the SRE register will be saved after a power cycle, toggle PSC after modifying SRE. For example: *SRE 32;*PSC 1;*PSC 0.