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## Version B11 firmware release notes

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## General Information

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### Supported models

This firmware is used on the following Keithley products: Model 2700

### Firmware upgrade and downgrade instructions

Download the following from the [Tektronix Support website \(https://www.tek.com/support\)](https://www.tek.com/support):

- Keithley Flash Wizard program (if you do not already have this).
  - Unzip the files in a folder of your choice and then run the "setup.exe" program.
  - Follow the instructions to install the program.
- The firmware revision image file you want to install on your Series 2700 instrument.

Perform the following steps to install the firmware revision onto the instrument:

1. Run the Flash Wizard program.
2. Select the appropriate interface at the Communications Select screen and follow any subsequent instructions.
3. The program should auto-detect the 2700.
4. You are asked to specify the firmware file.
5. The upgrade proceeds from there.

It typically only takes a few minutes using the GPIB interface.

Contact Keithley Instruments (<https://www.tek.com/keithley>) if you have any problems.

### Upgrade considerations for 2700

Due to hardware differences, the instrument must be at firmware revision B01 or higher to upgrade to B11. If the unit has the A01, A02, or A03 firmware revision, A03 is the highest upgrade possible without a hardware upgrade. Attempting to upgrade from version AXX to BXX without needed hardware requirements will damage the instrument and cannot be used. Contact Keithley Instruments (<https://www.tek.com/keithley>) for instructions and cost to upgrade Firmware from version AXX to version BXX.

Determine the firmware revision of your instrument using front panel or bus operation.

From the front panel: the firmware revision is briefly displayed during power sequence. When the instrument is turned on, the display annunciators will turn on for a short time. After that, the firmware revision will be briefly displayed as follows:

```
REV: yyy zzz
```

where:

yyy is the mainframe revision (e.g., A04 of the Model 2700).

zzz is the display board firmware revision (e.g., A01), which does not apply to this upgrade.

Using remote operation: Use the \*IDN? query command. After sending the \*IDN? command and addressing the instrument to talk, the following response message is sent to the computer:

```
KEITHLEY INSTRUMENTS INC.,MODEL wwww,xxxxxxx,yyy/zzz
```

where:

wwww is the mainframe model (2700).

xxxxxxx is the serial number of the mainframe.

yyy is the firmware revision of the mainframe.

zzz is the display board firmware revision.

The following table outlines the considerations that should be made when deciding to upgrade to this version or not from any previous version.

<b>Consideration</b>	<b>From B09</b>	<b>From B08</b>	<b>From B07</b>	<b>From B06</b>	<b>From B05</b>	<b>From B04</b>	<b>From B03</b>	<b>From B02</b>
Recalibration Required	No	No	No	No	Yes	No	No	No
Modules supported:								
Model 7708	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Model 7707, 7709	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
Model 7710	Yes	Yes	Yes	Yes	Yes	No	No	No
Model 7711, 7712	Yes	Yes	Yes	Yes	Yes	Yes	No	No

## Version B11 release notes

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### Resolved issues

<b>Issue Number:</b>	PR-58527
<b>Symptom:</b>	Adding channels to the scan list can sometimes cause the instrument to lock up.
<b>Resolution:</b>	The instrument will no longer lock up when adding channels to the scan list.
<b>Issue Number:</b>	PR-52257
<b>Symptom:</b>	The averaging filter can produce incorrect results if the filter type, window, or count are altered while the filter state is enabled.
<b>Resolution:</b>	Changing the filter type, window, or count while the filter state is enabled no longer causes incorrect results.
<b>Issue Number:</b>	PR-61638
<b>Symptom:</b>	If the relative timestamp has overflowed and the reading is formatted as ASCII, the reading string is malformed.
<b>Resolution:</b>	When the relative timestamp overflows and the reading is formatted as ASCII, the reading string remains correct.
<b>Issue Number:</b>	PR-61638
<b>Symptom:</b>	If the relative timestamp has overflowed, the instrument must be power cycled to reset the relative timestamp.
<b>Resolution:</b>	The relative timestamp now resets correctly when using <code>SYSTEM:TSTAMP:RELATIVE:RESET</code> or <code>*RST</code> , whether or not an overflow has occurred.

### Enhancements

There are no enhancements included in this release.

## Version B09 release notes

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### Resolved issues

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<b>Issue Number:</b>	PR-27873
<b>Symptom:</b>	Unit will occasionally time out and locks up in RS-232 mode when send MEAS : FREQ? Query.
<b>Resolution:</b>	This has been corrected.
<hr/>	
<b>Issue Number:</b>	PR-27417
<b>Symptom:</b>	Incorrect units are displayed when using user-defined units with MX + B in scan mode.
<b>Resolution:</b>	This has been corrected.
<hr/>	
<b>Issue Number:</b>	PR-26488
<b>Symptom:</b>	The SRQ does not occur to indicate the buffer is full. The fixed buffer overflow status bit is not reported correctly when using the always buffer.
<b>Resolution:</b>	The buffer overflow status bit now correctly reports the buffer status.

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### Enhancements

There are no enhancements included in this release.

## **Version B08 release notes**

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### **Resolved issues**

<b>Issue Number:</b>	PR-24118
<b>Symptom:</b>	A lock up error occurs if the temperature transducer is changed from 2 wire to 4 wire while the channel is already closed.
<b>Resolution:</b>	This has been corrected.
<b>Issue Number:</b>	PR-25242
<b>Symptom:</b>	Potential lock up occurs when scanning one channel for multiple readings for temperature or DC Volts.
<b>Resolution:</b>	This has been corrected.
<b>Issue Number:</b>	PR-25101
<b>Symptom:</b>	A “lockup 01” error occurs when exiting ratio from the front panel.
<b>Resolution:</b>	This has been corrected.
<b>Issue Number:</b>	PR-26264, PR-25241
<b>Symptom:</b>	Does not return correct timestamp format. When using the READ? or scratch buffer configured for a real time clock, the clock data will bring back 0.000, or relative clock information. Setting the trace buffer for the real time clock, then using the scratch buffer returns the real time clock information from the scratch buffer.  This remains true until the instrument is power cycled. Only the relative clock information is returned until configure the trace buffer for the real time clock again.
<b>Resolution:</b>	This has been corrected.
<b>Issue Number:</b>	PR-25241
<b>Symptom:</b>	Ratio mode does not use 1V range. It jumps from the 100mV to the 10V range, losing resolution.
<b>Resolution:</b>	Corrected the display formatting so that ratio and MX + B readings between 1.0 and 10.0 are no longer displayed on the 10volt range.

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<b>Issue Number:</b>	PR-26464
<b>Symptom:</b>	Unit does not SRQ on buffer full with a small size buffer. The buffer will not stop if only 2 points are stored, and the buffer full status bit is not enabled.
<b>Resolution:</b>	This has been corrected.

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<b>Issue Number:</b>	PR-25102
<b>Symptom:</b>	A 2 wire, 4 wire pairing problem occurs if channel autoconfigure is enabled and the function is changed while the channel is closed. If the configured function is 2 pole when the channel was closed, but 4 pole is selected after the channel is closed, the sense relays are not closed ( left open).
<b>Resolution:</b>	This has been corrected. The sense relays are now closed if function is changed after the channel is closed.

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<b>Issue Number:</b>	PR-26263
<b>Symptom:</b>	Incorrect ranges occur on Ratio / Channel average when channel average was used between two channels with different ranges.
<b>Resolution:</b>	This has been corrected.

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<b>Issue Number:</b>	PR-24526
<b>Symptom:</b>	When doing a scan, the units viewed through RECALL would not be correct for MX+B math. Similarly the units would be returned over the bus incorrectly if a READ? query was used to start a scan and return the results.
<b>Resolution:</b>	This has been corrected.

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## Enhancements

There are no enhancements included in this release.



## **Version B07 release notes**

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### **Overview**

B07 was not released. Corrections were implemented in B08.

## Version B06 release notes

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### Overview

Upgrading to B06 will result in a loss of User settings and communication configuration.

In rare instances where customers choose to Downgrade from B06 or higher to version B05 (or lower) the instrument will require a recalibration to preserve the accuracy of Low Frequency AC measurements.

### Resolved issues

<b>Issue Number:</b>	PR-21267
<b>Symptom:</b>	Scanning RTDs can read overflow or give false readings. Occurs only when Trigger count is greater than 1.
<b>Resolution:</b>	This has been corrected.
<b>Issue Number:</b>	PR-21358
<b>Symptom:</b>	First channel of RTD (4 wire scanning) is incorrect
<b>Resolution:</b>	Relays are updated properly so that if the channel happens to be closed prior to starting the scan, and to prevent false or overflowed readings while scanning.  This has been corrected
<b>Issue Number:</b>	PR-21762
<b>Symptom:</b>	Does not give correct reading when using :MEAS:FRES? the first time. The first time results in an overflow reading. If send the :MEAS:FRES? a second time, the correct reading is returned.
<b>Resolution:</b>	This has been corrected.
<b>Issue Number:</b>	PR-22451
<b>Symptom:</b>	Channel AutoConfigure gets reset when send * RST and :SYST:PRES
<b>Resolution:</b>	This has been corrected. AutoConfigure state is not a parameter affected by BUS resets.

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<b>Issue Number:</b>	PR-20932
<b>Symptom:</b>	Auto Scan does not work if power is interrupted between scans.
<b>Resolution:</b>	This has been corrected.

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<b>Issue Number:</b>	PR-20739
<b>Symptom:</b>	:MEAS:FRES? Query is closing the channel out of sequence with the selected function between 2 wire versus 4 wire.
<b>Resolution:</b>	This has been corrected.

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<b>Issue Number:</b>	PR-23015
<b>Symptom:</b>	If send a ROUT:MULTI:OPEN then ROUT:CLOS, the channel doesn't close.
<b>Resolution:</b>	This has been corrected.

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<b>Issue Number:</b>	PR-22805
<b>Symptom:</b>	:SYST:KEY 17 does not put the unit into LOCAL mode
<b>Resolution:</b>	This has been corrected.

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<b>Issue Number:</b>	PR- 23798
<b>Symptom:</b>	When scanning channels, occasionally the timestamp jumps by 200-300ms.
<b>Resolution:</b>	This has been corrected.

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**Enhancements**

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**Issue Number:** PR- 23015**Enhancement:** Improved inconsistent arrow key operation. Changed Model 7706 card configuration menu to allow up and down arrow key to access AOUT options

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## Version B05 release notes

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### Resolved issues

<b>Issue Number:</b>	PR-19443
<b>Symptom:</b>	Does not meet Model 7703 ACV scanning specifications. The specification is 155 rdgs/sec, but maximum achieved is about 100 rdgs/ sec
<b>Resolution:</b>	This has been corrected.
<b>Issue Number:</b>	PR-19080
<b>Symptom:</b>	Scanning TC's for temperature with internal reference junctions and subjecting the unit and card to a large temperature shock results in temperature readings considerably out of specifications. This issue was introduced in B04.
<b>Resolution:</b>	This has been corrected.
<b>Issue Number:</b>	PR-18574
<b>Symptom:</b>	Does not meet Model 7703 DCV scanning specifications. The specification is <185rdgs/sec, but the maximum achieved is about 132 rdgs / sec. This issue was introduced in B04.
<b>Resolution:</b>	This has been corrected.
<b>Issue Number:</b>	PR-18834
<b>Symptom:</b>	TRACE buffer data would be lost if using the Real Time timestamp and the power was cycled.
<b>Resolution:</b>	This has been corrected.
<b>Issue Number:</b>	PR-18193
<b>Symptom:</b>	SCPI short form command :CURR:APER results in a –113 undefined header error. SCPI long form command CURRent:APERture works correctly.
<b>Resolution:</b>	This has been corrected. Short form command does not give –113 error.



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<b>Issue Number:</b>	PR-18270
<b>Symptom:</b>	If Auto channel configuration is enabled, and a 4W measurement channel is closed, followed by a 2W measurement channel on the second half of a scan card, an "Invalid Chan" error occurs on the front panel and a "-221 Settings Conflict" error occurs on the bus.
<b>Resolution:</b>	This has been corrected.

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<b>Issue Number:</b>	PR-18391
<b>Symptom:</b>	If user setup has a CALC1 format other than PDEV and CALC1, the math result is incorrect when the user setup is recalled.
<b>Resolution:</b>	This has been corrected.

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<b>Issue Number:</b>	PR-18863
<b>Symptom:</b>	*RST does not display correct function. For example, is change function to 2 Wire resistance measurement and a *RST is sent, the display remains in Ohms function instead of changing to Volts as per *RST default.
<b>Resolution:</b>	This has been corrected. *RST now changes function to Volts.

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<b>Issue Number:</b>	PR-19489
<b>Symptom:</b>	Filter type is not selectable from front panel when measurement is Continuity, Frequency or Period.
<b>Resolution:</b>	This has been corrected.

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<b>Issue Number:</b>	PR- 19174, PR-19536
<b>Symptom:</b>	With Auto-Configure enabled and a scan list that contains at least one channel with ratio or Channel Average, moving the front panel left/right keys to close the channel that is using ratio/chan avg does not always pair the channels correctly.

**Resolution:**

The paired channel was getting left closed depending on when the next close command was executed relative to which phase the Ratio/ Average measurement was being done. The unit now opens all slot relays before closing the next channel if ratio/ chan ave is enabled.

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<b>Issue Number:</b>	PR-19843
<b>Symptom:</b>	The Real Time Clock (RTCL) gives bogus readings UNLESS readings have been stored in buffer.
<b>Resolution:</b>	This has been corrected.

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<b>Issue Number:</b>	PR-18853
<b>Symptom:</b>	RTD user type parameters, when saved as part of user saved setup, are reset after instrument is powered down and the setup is recalled.
<b>Resolution:</b>	This has been corrected.

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<b>Issue Number:</b>	PR-19331, PR-19344, PR-19377
<b>Symptom:</b>	ROUT:MULT:OPEN command correctly opens all channels but will incorrectly close the source and sense backplane relays (channel 24 and 25 on Model 7700 and Channel 44 and 45 on Model 7702).
<b>Resolution:</b>	This has been corrected. Backplane channels are no longer closed.

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<b>Issue Number:</b>	PR-19275
<b>Symptom:</b>	In the return string, the positions reporting the paired channels, 21st and 23rd position, PAIR does not show up.
<b>Resolution:</b>	This has been corrected.

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<b>Issue Number:</b>	PR-18214
<b>Symptom:</b>	Model 7712 response to SYST:CARDx:VMAX? returns 60 volts instead of 42.
<b>Resolution:</b>	This has been corrected. Response now returns 42 volts when query maximum voltage.

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<b>Issue Number:</b>	PR-19941
<b>Symptom:</b>	Invalid year is returned in the Recall buffer feature.

<b>Resolution:</b>	This has been corrected.
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<b>Issue Number:</b>	PR-19875
<b>Symptom:</b>	Out of specifications for RTD measurements at 600 degrees C.
<b>Resolution:</b>	This has been corrected.

  

<b>Issue Number:</b>	PR-19344
<b>Symptom:</b>	While sending ROUT:OPEN:ALL or ROUR:CLOS:ALL, or scanning with a channel closed will intermittently cycle the backplane relays on. The 7700 and 7702 will close the relays unnecessarily. The 7701, 7703, 7708, 7709, 7710 will open the relays unnecessarily.
<b>Resolution:</b>	This has been corrected.

  

<b>Issue Number:</b>	PR-18818
<b>Symptom:</b>	Intermittent overflow readings in DCV with AC input signal applied.
<b>Resolution:</b>	This has been corrected.

  

<b>Issue Number:</b>	PR-20470
<b>Symptom:</b>	When a channel is configured for frequency measurement either in a front panel advanced scan or a advanced scan over the bus, the measurements are not taken at the specified gate time/rate setting. Additionally, the buffer timestamps of the frequency channel and the channels that precede and follow the channel, are not logical. Occurs only in advanced scan, the measurements and buffer are acquired correctly for a simple scan configuration.
<b>Resolution:</b>	This has been corrected.

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**Enhancements**

<b>Issue Number:</b>	N/A
<b>Enhancement:</b>	Added support for Model 7710 Solid State Relay Module
<b>Issue Number:</b>	PR-19050
<b>Enhancement:</b>	Added ability to reset the trigger model during Monitor scans. Send command :ROUT:SCAN:LSEL NONE
<b>Issue Number:</b>	PR-18577
<b>Enhancement:</b>	Minimized possibility of overloading the front end circuits and improve accuracy on the ACV scans by configuring Scan operations across different functions / ranges differently. The sequence was to open old channel, close new channel, and change measurement configuration. The sequence is now to open old channel, configure the measurement, then close the new channel
<b>Issue Number:</b>	PR-18854
<b>Enhancement:</b>	Instrument will provide an overflow reading if negative voltages are seen in 4 wire ohm measurements

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