

Firmware Enhancements and Upgrade Procedure

General Description

New functionality includes a current measurement in the High Resistance Mode for calibration of insulation testers, a measurement to calibrate dc sensitive RCD testers, a hipot leakage current measurement in the Multimeter mode (high voltage load resistors required – using the 5320A-LOAD accessory), a hipot timer measurement and more. The two new hipot functions require a hardware upgrade, but all other enhancements are available through a firmware upgrade. New units shipped with upgraded hardware and firmware have serial numbers > 51111XXXX"

Improved capabilities to the 5320A Multifunctional Electrical tester are listed in this document. They coincide with both hardware and firmware improvement through various releases. The following information lists significant changes and improvements for various generations of upgrades. The more significant improvements are highlighted in yellow. The most recent updates are listed first.

Versions released in 2008 and later

Beginning in 2008 and continuing forward, a variety of minor bug fixes and instrument improvements were implemented. Those with meaningful instruments improvements are listed below, while minor bug fixes and other minor changes are not included.

Version 3.21

- Resistance multiplier maximum voltage is changed to 10kV.
- Screen saver implemented.
- High resistance source is internally released to the maximum available value (typically > 11 G Ohm) when in resistance multiplier mode only.
- Touch resistor values in RCD function (R1, R2, etc.) are available over interface.
- GBR relay 25 to 500 milliohm cleaning procedure implemented. It can be launched from SETUP/Maintenance item.
- In low resistance source function test current readings bellow 0.5 Ohm are displayed with question mark.
- A change in the auto ranging procedure was made for the 3A / 30A current function. It applies when either AC or DC mode is selected and an incorrect signal is applied.
- This firmware release and also previous releases contain HELP information related to Transfer ground bond function.

Version 3.18

- Range for "R multiplier R2" in the High resistance multiplier calibration menu was extended up to 30MOhm.

Release 3.16, December 2007

5320A firmware release 3.16 includes the enhancements described in the table below. It should be noted that one enhancement on the following table will require an additional hardware upgrade for instruments with serial numbers as noted. Without the hardware upgrade the capabilities provided by these enhancements will not be possible when operating the 5320A with a serial number in this range.

Item	Enhancement	5320A Function	Hardware Upgrade Required?	Calibration Needed with Upgrade?
1	A RESCAN softkey is added in the Loop and Line Impedance modes. The RESCAN key is used to (re)measure the mains impedance the 5320A is operating from. It has a time limit as to how often it can be used, (approx once every 1.5 minutes) due to internal heating.	Loop/ Line Impedance Source	No	No
2	Help menus are now available in simplified Chinese.	All	No	No
3	A "Transfer Ground Bond Resistance" mode has been added for Z GND (Ground Bond Resistance). This feature utilizes the Ground Bond resistors in conjunction with the built in Meter to accurately measure the internal resistors at the same time as the Unit Under Test. There are 6 values available, nominally 50 mohm to 550 mohm. Best uncertainty is now < 1 mohm, depending upon R nominal and UUT stimulus current.	Ground Bond Resistance Source	No	No
4	Loop and Line Impedance Setup has an entry for "Serial Resistance", a manually entered value that is used to offset the cable adaptor lead resistance.	Loop/ Line Impedance Source	No	No
5	RCD verification can be tested down to 20 ms.	RCD Verification	Yes ¹ for units with S/N <51112XXXX	No
6	A digital filter has been added to the current readings in the Leakage Current modes, to quiet the displayed reading.	Leakage Current	No	No
7	RCD trip time calibration procedure is modified for recalibration using AC current (instead of DC current)	RCD calibration menu	No	No
8	Corrected Spec Error on Displayed Spec value in Line/Loop	Line / Loop Impedance Source	No	No

Fluke 5320A Multifunction Electrical Tester Calibrator

Release 3.07, June 14, 2007

The upgrade to 3.07 includes two new enhancements

Item	Enhancement	5320A Function	Hardware Upgrade Required?	Calibration Needed with Upgrade?
1	In the High Resistance source function the maximum allowed voltage for the 1.0000 MΩ to 9.999 MΩ range is increased to 1150V (from 1100V).	High Resistance Source	No	No
2	The maximum voltage for the High Resistance source Resistance Multiplier adapter is increased to 10 kV _{peak} . No modifications are required for the R Multiplier Adapter to accept 10 kV _{peak} sourced into the input. Applications are for 10 kV Megohmmeter calibration.	High Resistance Source/ R Multiplier	No	No

Release 3.06, May 10, 2007

5320A firmware release 3.06 includes the enhancements and additional protection described in the table below. It should be noted that several enhancements on the following table will require an additional hardware upgrade for instruments with serial numbers ≤51111XXXX. Without the hardware upgrade the capabilities provided by these enhancements will not be possible when operating the 5320A with a serial number in this range.

Firmware enhancements:

Item	Enhancement	5320A Function	Hardware Upgrade Required?	Calibration Needed with Upgrade?
1	Insulation resistance tester current measurement added to the High Resistance Source function. Test current measurement results are displayed in the parameters window and can be accessed remotely over the communication interface.	High Resistance Source	No	No
2	Positive and negative DC test current recognition added to RCD trip time and current calibration modes for RCD testers with DC sensitive test current functionality.	RCD Trip Time and Current	No	No
3	The maximum trip current is measured and displayed as a maximum hold value by the calibrator in the RCD trip current mode. The maximum value can be accessed remotely over the communication interface.	RCD Trip Current	No	No
4	Additional protection added to the Loop impedance “COMP” mode (5320A/VLC units only). The additional protection will help protect the compensation circuitry from loop testers with high test current output.	Loop Impedance	No	No

Fluke 5320A Multifunction Electrical Tester Calibrator

5	French, German, Italian and Spanish translations added to the Help menu.	Help Menu	No	No
6	Hipot leakage current mode added to the Meter function. Using external load resistors to sink current (5320A-LOAD accessory available June 2007), hipot leakage current can be calibrated up to 300 mA.	Meter	Yes¹ for units with S/N <51112XXXX	Yes
7	Hipot timer calibration added to the Meter function. In the timer mode the 5320A can sense the duration of a timed hipot test (1000 V or less) from 0.1 seconds to 999 seconds with an uncertainty of 0.02% + 2 ms.	Meter	Yes¹ for units with S/N <51112XXXX	Yes
8	The selection, and associated capability, to verify and calibrate the RCD trip time of the 5320A was added to the calibration menu	Verification of RCD Trip Time	Yes¹ for units with S/N <51112XXXX	No

1. Hardware upgrades are required for these enhancements. Order Fluke service item #3050949 to get a hardware upgrade. For a quote on the hardware upgrade and the required calibration, contact a Fluke service center or a local Fluke sales representative. Hardware upgrades are not user installable. A hardware upgrade is not needed for enhancements 1 through 5.

Firmware Upgrade Procedure

The following firmware upgrade procedure should take approximately 5 to 10 minutes.

System Requirements and Software Required to Upgrade Firmware

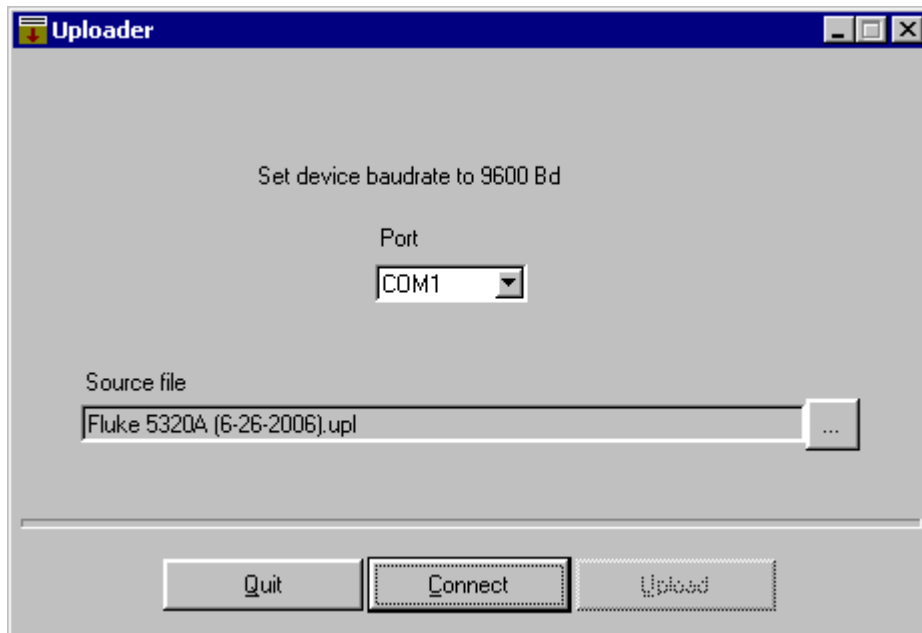
- PC running Microsoft Windows 95 or higher. The computer must have a 9-pin serial port (RS-232) or a USB port. The use of a USB port requires a USB-to-serial converter with a male DB-9 RS232 connector.
- Install the software “Uploader” program on the PC. After installation, the computer will need to be re-booted.
- Firmware source file (extension “upl”)

Installing the Uploader Program

Run the “setup.exe” file from the installation folder. By default the uploader program will create a directory in “Start->Program files->Uploader”.

Uploading Firmware to the 5320A

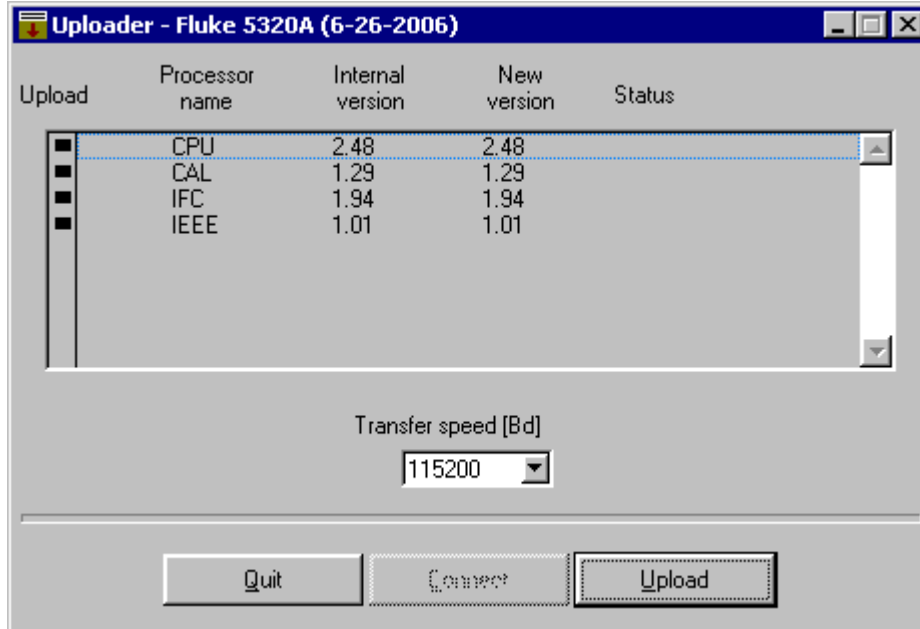
1. Set the following items in the Calibrator’s setup menu:
Active interface ... RS232
Baud rate 9600
2. Connect the Calibrator and the computer with an RS-232 cable. The RS-232 cable required is a straight-through cable. A straight-through RS-232 cable can be purchased at most electronic/computer stores or can be purchased from Fluke as part number 943738.
3. Start the Uploader program. “Start->Program files->Uploader->Uploader.exe”
The following screen will appear:



Note: The source file in the above screen is an example of a “upl” firmware file. The actual file name for firmware revision 3.06 is different. The version 3.06 file name is “Fluke_5320A_HW2_rel_3_06.upl”

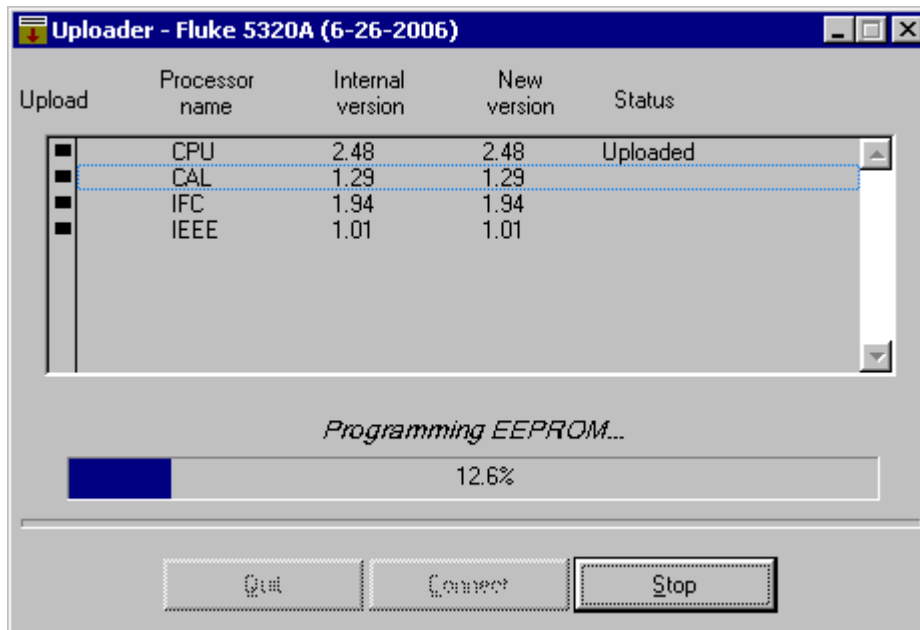
Fluke 5320A Multifunction Electrical Tester Calibrator

4. Select computer's COM port (COM1 ... COM8) for serial transfer. Use the "...” button to browse the computer for the firmware source file. The firmware source file has the extension "upl".
5. Press "**Connect**". The Uploader program displays the firmware version to be installed on the Calibrator.



Note: The "Internal version" firmware on the 5320A may differ from the example screen shown above. The "New version" will have the following firmware numbers: CPU: 3.06, CAL: 1.31, IFC: 2.15, IEEE: 1.01

6. Press "**Upload**" to continue the upload process.

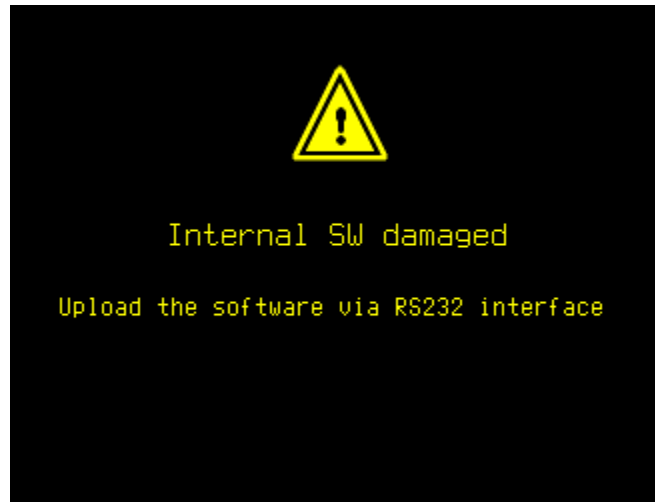


Fluke 5320A Multifunction Electrical Tester Calibrator

7. The Uploader program automatically loads new firmware for the CPU, CAL, IFC and IEEE.

Incomplete Installation

If during the installation a power failure occurs or communication is interrupted, the Calibrator won't have complete firmware. To continue with the firmware upgrade switch the Calibrator's power supply off, wait 10 seconds and switch the power on. The Calibrator will display the following screen:



From the computer, repeat the installation process. The Calibrator is switched to RS-232 communication at 9600 Baud automatically to accept the firmware upgrade file.