

General

The procedure supplied has all the required measurement points plus all the adjustments tests needed to calibrate a 3000 series calibrator. The procedure is semi automatic and will automatically step through by itself. The user will be prompted when lead changes etc are required. To perform the adjustments the procedure calls programs external to ProCal, which must be installed in the correct directory.

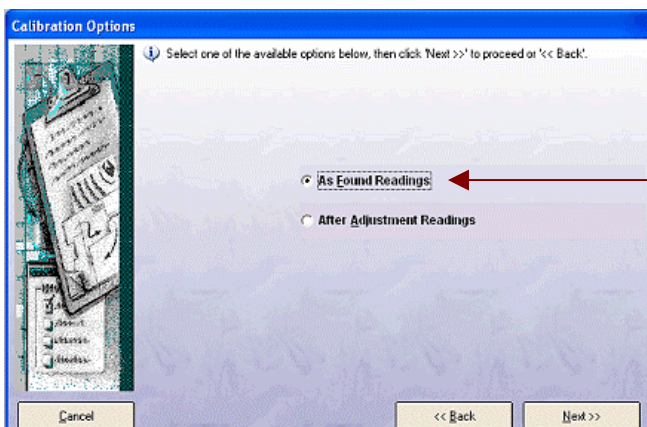
In addition ProCal will need to know the values of the current shunts used to measure the higher currents, so as to calculate the current from a measured voltage. These must be entered in ProSet before using the procedure. See appendix.

ProCal will control both the 3000 series calibrator under test using an RS232 interface, and also the measuring DMM, using the GPIB interface. Both interfaces must be available for the procedure to run.

This Procedure has been developed to work with the HP3458A DMM, plus other specific instruments, including an RCL meter. See appendix for required equipment.

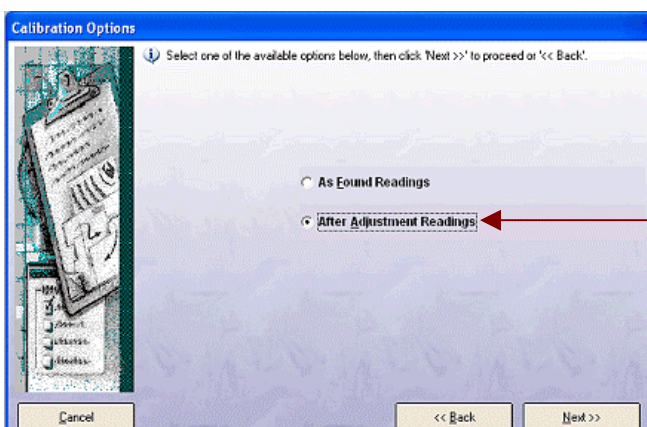
Calibrating a 3000 Series calibrator using this procedure:

1: Select the measurement option in ProCal to take found measurements.



If adjustments are required :

2: Select the measurement options in ProCal to take the after adjustment measurements, with the option to 'run adjustment tests' also selected.



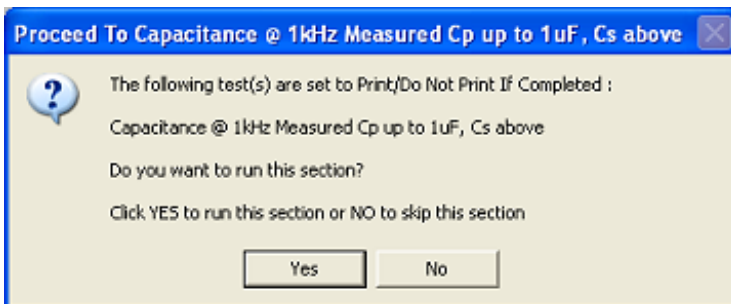
When ProCal runs an adjustment test, a measurement is taken, and then ProCal will calculate the required adjustment, sending the updated calibration constant back to the calibrator. ProCal will then automatically restart that test. Calibration tests do not print on the certificate.

Test in the supplied procedure are divided into sections, such as DC voltage, and then sub divided into ranges. Each range will have a block of adjustment tests, followed by a set of calibration measurement tests. When ProCal is taking after adjustment results, ProCal will first step through the adjustments tests, the results of which are non-printing, and then through the calibration measurement tests which are reported on the certificate.

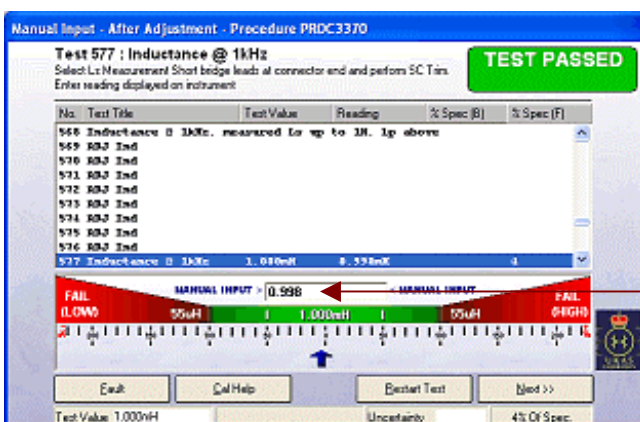
Review Calibration Results - Tests Incomplete - Procedure PROC3370
Calibration Results (After Adjustment)
 Tests Incomplete: 229 Tests Marginal Pass: 0 Tests Failed: 3

No.	Test Title	Test Value	Reading	% Spec (B)	% Spec (F)
1	DC Voltage				
2	DC ZERO	0.000000V	0.000000V	0	
3	200mV Load Check	50.0000mV	0.0000mV	500	
4	200mV Zero ADJ				
5	200mV +FS RRD				
6	200mV -FS RRD				
7	200mV Range	0.0000mV	0.0000mV	0	
8	200mV Range	100.0000mV	0.0000mV	>999	
9	200mV Range	200.0000mV	0.0000mV	>999	
10	200mV Range	-100.0000mV	0.0000mV	>999	
11	200mV Range				
12	----- Blank Line -----				
13	DC ZERO				
14	2V Load Check				
15	2V Zero RRD				
16	2V +FS ADJ				
17	2V -FS ADJ				

The 3000 series has several options combinations, for example oscilloscope and inductance. All options and their combinations are covered in this procedure. A special feature in ProCal allows sections of a procedure to be either run or skipped as the calibration is performed. Before each option section is started the user is prompted as to if this section should be run, answer yes to run, no to skip. (The internal options installed in a 3000 series are listed on the instruments rear panel.)



Some tests in the procedure require the user to manual input the result. This allows the laboratory performing the calibration to use available equipment, even without an interface.





Section	Option	Adjustment
DC Voltage		Y
AC Voltage		Y
DC Voltage linearity		N/A
DC Current		Y
AC Current		Y
2 Wire Resistance		Y
Simulated Resistance	Y	VFP
4 Wire Resistance		Y
PT100	Y	M
Capacitance		M
Simulated Capacitance	Y	VFP
Inductance	Y	M
Frequency standard 20ppm		N/A
Frequency 1ppm	Y	INTERNAL TRIM
Oscilloscope Amplitude	Y	VFP
Oscilloscope Timebase	Y	VFP
600MHz Bandwidth/Level	Y	VFP
350MHz Bandwidth/Level	Y	VFP
50KHz Ref level and freq	Y	VFP
Power, Volts/Current, Phase	Y	VFP

KEY

Y	Fully closed loop in ProCal
M	Manual entry of values in ProCal
VFP	Adjust only by using the Virtual Front Panel Program
INTERNAL TRIM	Physical adjustment inside instrument
N/A	Will never require adjustment.


Note : *Not all adjustments can be carried out by the ProCal procedure at this time.*

Manual Adjustments

On these tests ProCal will need the user to enter the measured value using the keyboard. If it is an adjustment test and ProCal decides the value should be adjusted ProCal will prompt with a box to enter the measured value in, the user must input the measured value again, which ProCal will calculate the new calibration constant and send to the calibrator. The test is then started again, just as with an automatic test and the user must input the measured value in again. Now the test should pass and ProCal will step on to the next value.

Adjustments requiring the VFP program.

It is possible to run ProCal in one 'Window' and run the VFP program in another window and switch between them.

Please Note : ProCal must not be in a Test when switching to the VFP program. Click the hand button  in ProCal first; this will close the COM port, which must then be opened in the VFP program by using the open/close COM port button.



Appendix : Equipment Required.

- 1 : HP3458A DMM
- 2 : LCR meter with suitable accuracy.
- 3 : 1 ohm 2 Amp Shunt resistor with calibrated value entered in ProSet
- 4 : 0.1 ohm 30 Amp shunt resistor with calibrated value entered in ProSet
- 5 : 2 off 1 metre coax screen leads, high insulation with low thermal 4mm plugs
- 6 : 10MHz frequency reference.
- 7 : 50-ohm terminator
- 8 : High Bandwidth Oscilloscope.
- 9 : BNC to 4mm converter.
- 10 : PC loaded with ProCal and the 3000 VFP programs and fitted with GPIB and RS232 interfaces.

Notes on equipment.

For Simulated capacitance a battery powered (handheld) meter should be used.

