

The 950038 Calibration Kit is used to calibrate and adjust the QuadTech/IET Labs 1910 and 1920 Series LCR Meters and consists of five calibration resistors, an open-circuit module, a short-circuit module and V-Cal Box.

The use of the 950038 Calibration Kit will bring the 1910 and 1920 LCR meters back to factory specification.

The R and Q values, at selected frequencies, are given on the enclosed Certification of Calibration traceable to an SI.

The 950038 Calibration Kit can also be used for calibration of the IET/QuadTech 7000 Series LCR Meters, GenRad/IET 1689 and 1693 Digibridge RLC Meters.

Features:

- 5 Resistors, open and short
- V-Cal Box for voltage and current adjustment
- 1 meter BNC Cable 1689-9602
- Rugged case
- Calibration Certificate
- Z-Foil Bulk Metal[®] Resistors



950038 Calibration Kit

SPECIFICATIONS

Nominal Values:

R1 - 95.3 k Ω

R2 - 5.97 k Ω

R3 - 374 Ω

R4 - 24.9 Ω

R5 - 5 Ω

Open and Short

V-CAL Box

Initial Adjustment Accuracy: 0.1% of nominal value

Stability: $< \pm 25$ ppm/year; typically drift is less than 60 ppm total over 10 years

Temperature Coefficient: < 1.5 ppm/ $^{\circ}$ C

Calibration Accuracy:

These resistors are calibrated with an measurement uncertainty of better than 20 ppm at DC .

Measurement uncertainty of the nominal Q values are within 100 ppm at 1 kHz. All other R and Q values at other frequencies are mathematically calculated. All calibrations are made at $23^{\circ} \pm 2$ C $^{\circ}$.

ORDERING INFORMATION

STANDARD MODELS

950038 Calibration Kit
Includes: 1689-9602 BNC Cable
Calibration Certificate Traceable to SI



INSTRUCTIONS

NOTE:

Instrument should be powered up for a minimum of 1 hour before calibration in a temperature stabilized room at $23^{\circ}\text{C} \pm 2^{\circ}\text{C}$

Procedure:

WARNING: This should not be done unless you have a calibrated 950038 and VCal Box.

The 1920 firmware will prompt the operator with step by step instructions on the screen to go through the adjustment procedure.

If you press the STOP button at anytime during the adjustment, the adjustment process will stop and no changes will be made to the 1920.

Please note that this calibration shown below is for Cable Comp. of 1 meter. This adjustment procedure should be done for 0 meter and 2 meter.

To change which calibration adjustment is performed go to
[UTILITY FUNCTIONS]
Cable Comp.
1 M Cable

Use \uparrow and \downarrow to change between 0, 1 and 2 meter cable lengths. If this is set to 1 M Cable then the Utility Function below will indicate Cal with 0 M cable.

5.2.1 Start of Adjustment

Goto
[UTILITY FUNCTIONS]
Cal with 1 M Cable
Cal Due: <date>

Press Up \uparrow until display shows
Cal with 1 M Cable
Full Cal \rightarrow

Press Right \rightarrow

Enter Calibration Code

0000000 \rightarrow

Use \uparrow and \downarrow to change each value and \rightarrow to move from one digit to the next

The code 1900225 must be entered to proceed into calibration

Press Right \rightarrow when correctly entered to move to next screen

Display will show

Cal

Date Today: xx/xx/xxx

Use \uparrow and \downarrow to change each value and \rightarrow to move from one digit to the next and enter today's date

Once complete the 1920 will move on to entering calibrated values from the 950038 for each of 5 resistors.

Display should show

Points at 5.0000 Ω
4

Press Right \rightarrow

Display should show
Frequency for R/Q pair
DC

Press Right \rightarrow

Display should show
R at DC
4.9xxx Ω

Use \uparrow and \downarrow increment or decrement the value until it matches the value of the 950038 for the 5 Ω standard at dc.

Press Right \rightarrow when complete

Display should show
Q at DC (ppm)

0

Note that Q is always 0 for dc however at other frequencies you will have to enter value from calibration certificate of the 950038.

Press Right \rightarrow

Display should show
Frequency for R/Q pair
1.0000 kHz

Press Right \rightarrow

Display should show
R at 1000 Hz
4.9xxx Ω

Use \uparrow and \downarrow increment or decrement the value until it matches the value of the 950038 for the 5 Ω standard at 1 kHz.

Press Right \rightarrow when complete

Display should show
Q at 1000 Hz (ppm)
X where X is a number

This process has to be repeated for each of the 5 resistors and at all required frequencies.

Once the 95 k Ω standard has been complete you will be prompted to

Connect the VCAL box, SW = OFF
Press START to continue

AC Voltage Adjustment

Connect the VCAL box to the 1920 and the DMM to the VCAL Box

Press START button once box is connected.

Display should show

Enter RMS volts:
1.0000 V

Measure the RMS ac voltage on the DMM and use \uparrow and \downarrow to increment or decrement the value until it matches the value on the DMM.



INSTRUCTIONS

<p>Press Right → to initiate measurement of the voltage on the 1920</p>	<p>Enter DC volts: 1.0000 V</p>	<p>it matches the value on the DMM without minus sign.</p>
<p>Display should show Enter RMS volts: 100.00 mV</p>	<p>Measure the dc voltage on the DMM and use ↑ and ↓ to increment or decrement the value until it matches the value on the DMM.</p>	<p>Press Right → to initiate measurement of the voltage on the 1920</p>
<p>Measure the RMS ac voltage on the DMM and use ↑ and ↓ to increment or decrement the value until it matches the value on the DMM.</p>	<p>Press Right → to initiate measurement of the voltage on the 1920</p>	<p>Display should show Connect the VCAL box, switch ON. Press START to continue</p>
<p>Press Right → to initiate measurement of the voltage on the 1920</p>	<p>Display should show Enter negative DC volts: 100.00 mV</p>	<p>Note this does current calibration using 5 Ω resistor</p>
<p>Display should show Connect the VCAL box, switch ON. Press START to continue</p>	<p>Note: on DMM it should be negative. Do not enter minus sign.</p>	<p>Press START button once box has been switched to ON.</p>
<p>Note this does current calibration using 5 Ω resistor</p>	<p>Measure the negative dc voltage on the DMM and use ↑ and ↓ to increment or decrement the value until it matches the value on the DMM without minus sign.</p>	<p>Display should show Enter dc volts: 500.00 mV</p>
<p>Press START button once box has been switched to ON.</p>	<p>Press Right → to initiate measurement of the voltage on the 1920</p>	<p>Measure the RMS dc voltage on the DMM and use ↑ and ↓ to increment or decrement the value until it matches the value on the DMM.</p>
<p>Display should show Enter RMS volts: 500.00 mV</p>	<p>Display should show Enter DC volts: 10.00 mV</p>	<p>Press Right → to initiate measurement of the voltage on the 1920</p>
<p>Measure the RMS ac voltage on the DMM and use ↑ and ↓ to increment or decrement the value until it matches the value on the DMM.</p>	<p>Measure the dc voltage on the DMM and use ↑ and ↓ to increment or decrement the value until it matches the value on the DMM.</p>	<p>Display should show Enter dc volts: 500.00 mV</p>
<p>Press Right → to initiate measurement of the voltage on the 1920</p>	<p>Press Right → to initiate measurement of the voltage on the 1920</p>	<p>Measure the RMS dc voltage on the DMM and use ↑ and ↓ to increment or decrement the value until it matches the value on the DMM.</p>
<p>DC Adjustment</p>	<p>Display should show Enter negative DC volts: 10.00 mV</p>	<p>Note: on DMM it should be negative. Do not enter minus sign.</p>
<p>Display should show Connect the VCAL box, switch OFF. Press START to continue</p>	<p>Note: on DMM it should be negative. Do not enter minus sign.</p>	<p>Press Right → to initiate measurement of the voltage on the 1920</p>
<p>Press START button once box is connected and switch OFF.</p>	<p>Measure the negative dc voltage on the DMM and use ↑ and ↓ to increment or decrement the value until</p>	<p>Connect Open, Short and Resistors</p>
<p>Display should show</p>		<p>The 1920 will prompt to connect open, short and then each standard.</p>



INSTRUCTIONS

So display shows
Connect OPEN Standard
Press START to continue.

Press START button open is
connected from the 950038 Kit.

This will continue for each stan-
dard.

At the end of all standards the
1920 will prompt to save calibra-
tion coefficients.

Do not turn off this takes time to
store the coefficients.

End of procedure

