



Impedance Calibrator OCM550

- ✓ Ultra stable Components
- ✓ Frequency Range to 1 MHz
- ✓ Self-calibration Mode
- ✓ Keypad, GPIB, RS232



Impedance Calibrator OCM550 is designed for calibration of LCR meters. It contains decades of ultra-stable resistance, capacitance and inductance standards of firm decimal values. The total range of settings covers values

from 0.1 Ohm to 100 MOhm, 10 pF to 100 μF and 10 μH to 10 H. The calibrator offers four pair terminal and four terminal coaxial output connectors for calibration of precise and wide range LCR meters, four terminal and two terminal non-coaxial output connectors for calibration of simple and elder LCR meters.

The frequency ranges from 20 Hz to 1 MHz in coaxial mode and to 100 kHz in non-coaxial operation mode. The calibration memory contains both complex parameters of partial standards. The calibration values can be displayed in wide range of frequently used pairs of complex impedance and admittance. Either parallel or serial equivalent model can be selected. The calibrator is equipped with reference terminals position OPEN and SHORT for easy elimination of test cables influence.

A part of the calibrator is built in level meter for the voltage and the frequency of the generated test signal. The self-calibration procedure is protected with a password and permits entire recalibration.

OCM550 impedance calibrator is equipped with large size colour LCD display. The settings can be controlled manually from front panel keypad or remotely by using GPIB or RS232 interface. OCM550 can be used with the Calibration Software CALIBER.

SPECIFICATIONS (Reference temperature $23 \pm 1^\circ\text{C}$)

Modes	4TP	R/L/C	Four pairs of coaxial terminals BNC
	4W	R/C	Four terminals for non-coaxial connection
	2W	R/C	Two terminals for non-coaxial connections

Outputs	Four BNC for 4TP coaxial termination
	Four terminals for non-coaxial connections 2W/4W

Frequency Range	20Hz to 1MHz
Reference Positions	SHORT, OPEN

Resistors	0.1Ohm to 100MOhm, firm values in 4TP and 4W mode
	0.1Ohm to 10MOhm, firm values in 2W mode
Deviation	0.1% to 10% from nominal value, depending on value and operation mode
Accuracy	Calibration uncertainty 0.02% to 1% @ 1kHz, depending on value and mode
T/C	2 to 25 ppm/°C
Displayed Pairs	Z/e, Y/e, Rs/Ls, Rs/Cs, Rp/Cp, Rp/Lp, R/X, G/B

Capacitances 10pF to 100μF, firm values in 4TP operation mode
 100pF to 100μF, firm values in 4W and 2W mode
 Deviation < 5% from nominal value
 Accuracy Calibration accuracy 0.05% to 5% @ 1kHz, depending on value and mode
 T/C 50 ppm/°C max.
 Displayed Pairs Z/e, Y/e, Cs/D, Cs/Rs, Cp/D, Cp/Rp, Cp/G

Inductances 10μH to 10H only in 4TP operation mode
 Deviation <15% from nominal value
 Accuracy Calibration accuracy 0.1% to 4% @ 1kHz, depending on value and mode
 T/C 50 ppm/°C max.
 Displayed Pairs Z/e, Y/e, Ls/Q, Ls/Rs

Test Level Meter
 Display Frequency, Voltage and Current of the tested signal
 Frequency Range 20Hz to 100kHz, resolution 6 digits, accuracy 0.01% + 1 ms
 Test voltage 200mV to 10V rms, resolution 4 digits
 Accuracy 5% in a range from 100mV to 1V
 Accuracy 2% in a range from 1V to 10V
 Test Current 1nA to 500mA, resolution 4 Digit

General Data
 Data Bus RS232, GPIB
 Ref. Temperature 23°C ± 2°C @ < 80% r.F.
 Working Temp. 15 to 30°C
 Storage Temp. -10 to 40°C
 Supply 115/230V, 50/60Hz, consumption 45VA



Typical 4TP connection

4TP Resistors

Nominal value serial resistance Rs	1 year stability (typical)	Maximum. deviation from nominal value @ 1 kHz	Calibration inaccuracy @ 1 kHz	Temperature coefficient (max.)	Max. test voltage/current	Maximum R- deviation @ 100 kHz
Ω	%	%	%	%/°C	V/mA	%
0.1	0.001	2.00	0.20	0.0050	200 mA	--
1.0	0.001	1.00	0.10	0.0002	100 mA	5.00
10	0.001	0.50	0.05	0.0002	50 mA	0.20
100	0.001	0.10	0.02	0.0002	15 mA	0.03
1k	0.001	0.10	0.02	0.0002	5 V	0.05
10 k	0.001	0.10	0.02	0.0002	15 V	0.03
100 k	0.001	0.10	0.02	0.0002	30 V	0.10
1 M	0.003	0.10	0.03	0.0002	30 V	--
10 M	0.010	0.20	0.05	0.0010	30 V	--
100 M *	0.010	1.00	0.50	0.0050	30 V	--

4TP Capacitors

Nom. value parallel capacitance C_p	1 year stability (typical)	Deviation from nom. value @ 1 kHz	Calibration inaccuracy @ 1 kHz	Temp. coeff. (max.)	Dissipation factor @ 1kHz (typ.)	Max. test voltage / current	Typ. capacity deviation @ 100 kHz
F	%	%	%	%/°C	-	V/mA	%
10 p	0.010	0.5 pF	1.00	0.005	< 0.0020	30V	-0.10
100 p	0.010	5	0.10	0.005	< 0.0010	30V	-0.02
1 n	0.010	5	0.05	0.005	< 0.0005	30V	0.00
10 n	0.010	5	0.05	0.005	< 0.0005	30V	+0.01
100 n	0.010	5	0.05	0.005	< 0.0005	20V	+0.03
1 μ	0.010	5	0.05	0.005	< 0.0010	10V	+0.20
10 μ	0.015	5	0.10	0.010	< 0.0050	100mA	--
100 μ	0.015	5	0.10	0.010	< 0.0200	200 mA	--

4TP Inductances

Nom. value serial inductivity L_s	1 year stability (typical)	Deviation from nom. value @ 1 kHz	Calibration inaccuracy @ 1 kHz	Temp. coeff. (max.)	Serial resistance R_s (typical)	Max. voltage / current	Typical inductivity deviation @100kHz
H	%	%	%	%/°C	Ω	V/mA	%
10 μ	0.01	15	0.30	0.005	66	50mA	0.10
100 μ	0.01	15	0.20	0.005	200	30mA	0.10
1 m	0.01	15	0.10	0.005	660	5 V/20mA	0.10
10 m	0.01	15	0.10	0.005	660	5 V/10mA	0.10
100 m	0.01	15	0.10	0.005	2 000	10 V	4.00
1	0.01	15	0.10	0.005	20 000	10 V	--
10	0.01	15	0.10	0.005	20 000	10 V	--

4W and 2W Resistors

Nominal value serial resistance R_s	1 year stability (typical)	Max. test voltage / current	Temp. coeff. (max.)	4W mode deviation from nominal value @1 kHz	4W mode calibration inaccuracy @1kHz	2W mode calibration inaccuracy @1kHz
Ω	%	V/mA	%/°C	%	%	%
0.1	0.001	200 mA	0.0050	2.0	0.50	--
1.0	0.001	500 mA	0.0002	1.5	0.10	5.0
10	0.001	150 mA	0.0002	1.0	0.05	0.5
100	0.001	50 mA	0.0002	1.0	0.05	0.1
1k	0.001	10 V	0.0002	1.0	0.02	0.1
10 k	0.001	30 V	0.0002	1.0	0.02	0.1
100 k	0.001	50 V	0.0002	1.0	0.05	0.1
1 M	0.003	50 V	0.0002	1.0	0.20	0.2
10 M	0.010	50 V	0.0010	2.0 @ 100Hz	0.2 @ 100Hz	0.5
100 M	0.010	50 V	0.0025	10.0 @ 100Hz	1.0 @ 100Hz	--

4W und 2W Capacitors

Nominal value parallel capacity Cp	1 year stability (typical)	Temp. coeff. (max.)	Max. voltage/current	4W mode deviation from nominal value @1 kHz	4W mode calibration inaccuracy @1kHz	2W mode calibration inaccuracy @1kHz
F	%	%/°C	V/mA	%	%	%
100 p	0.015	0.050	30V	10	1.0	5.0
1 n	0.010	0.010	30V	10	0.10	1.0
10 n	0.010	0.050	30V	10	0.05	0.2
100 n	0.010	0.050	20V	10	0.05	0.2
1 μ	0.010	0.050	10V	10	0.05	0.2
10 μ	0.015	0.010	100mA	10	0.10	0.5
100 μ	0.150	0.010	200 mA	10	0.20	1.0

Calibration of LCR Meters

OCM550 contains high precision and frequency independent Standards of resistors, capacitors and inductances. The calibrator can be controlled from the keyboard or remotely from the data ports which permits automates calibration in production lines. By using the 4TP connection LCR meters can be calibrated in the frequency range up to 1MHz with correction of the connecting cables.

Long Term Stability

The excellent long time stability and low temperature coefficient are features of the OCM550. The large scale colour display shows the calibration values of the selected parameters as well as the calibration uncertainty. The build-in Level Meter can be used to display the frequency, voltage and current of the generated signal.

Calibration

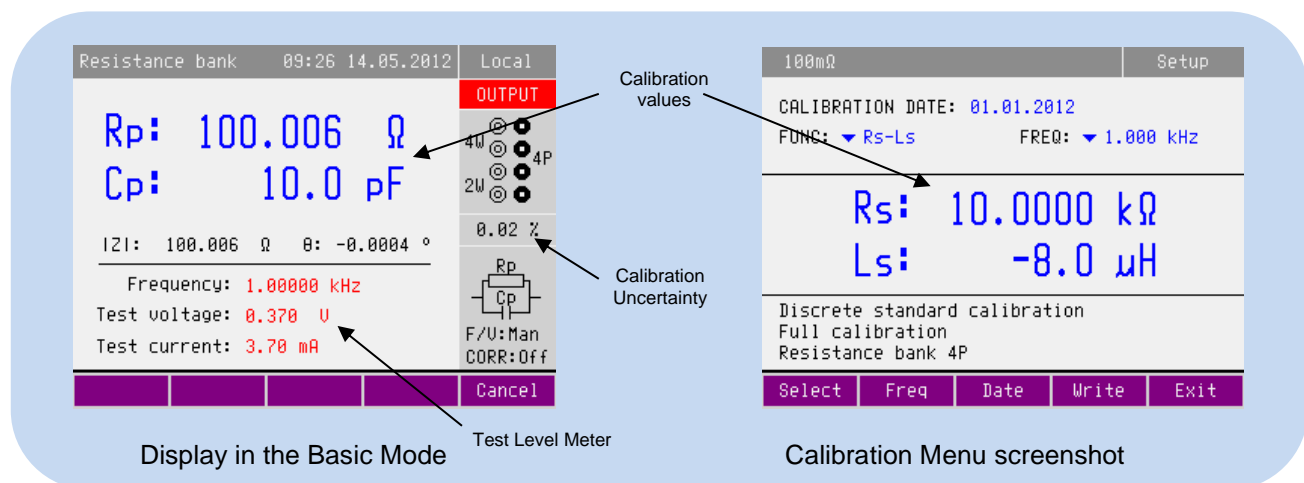
Internal calibration menu can be used for recalibration of internal Standards. Two calibration methods are available: Entire calibration and Offset calibration. The entire calibration permits calibration of individual Standards at certain frequencies. Offset calibration permits calibration of main parameters at a frequency of 1kHz.

Correction Mode

The calibration values in 4TP mode can be corrected by using the OPEN, SHORT and LOAD features. OPEN and SHORT are used for compensation of the influence of the connecting cables.

Inductance Standards

The inductance Standards are accessible in the 4TP mode only. They will be used for calibration of LCR meters in auto-balanced connection. All inductance standards are not wire-wound components.



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