

# DIGITAL LC METER OPERATION MANUAL

## 1. FEATURES

- ❖ Easy and correct readout.
- ❖ High measuring accuracy.
- ❖ Measurements are possible even under a strong magnetic field.
- ❖ LSI-circuit provides high reliability and durability.
- ❖ Input overload protection is provided.
- ❖ LCD display for low power consumption and clear readout even in bright ambient light conditions.
- ❖ In-line pushbuttons allow one hand operation.
- ❖ Light-weight and compact construction for easy operation.
- ❖ Low battery condition is indicated on the LCD display.
- ❖ Back light.
- ❖ Data hold.

## 2. SPECIFICATIONS

### 2-1. GENERAL SPECIFICATIONS

Display	: LCD (Liquid Crystal Display) Max. Indication 1999.
Measurement	: L (Inductance) ; C (Capacitance)
Over-Range	: Display shows "1".
Sampling Rate	: 3 times/second.
Operating Temp	: 0°C to 40°C, humidity<80 %
Power Supply	: Single, standard 9 volt battery. NEDA 1604IEC6F22
Dimension	: 140mm(H)×70.6mm(W)×31mm(D).
Weight	: Approx.200g (including Battery).
Standard Accessories:	Test alligator clips (red & black)...1 pair. Instruction manual.....1 pc. Conform card 1 pc.

### 2-2 ELECTRICAL SPECIFICATION

Accuracy is  $\pm$ (percentage of reading + number of digit) at  $23 \pm 5^\circ\text{C}, <75\%RH$ .

L(Inductance)				
Range	Accuracy	Resolution	Test Frequency	Current through Inductance under test
2mH	$\pm (2\%+5d)$	1uH	200Hz	60uA
20mH		10uH	200Hz	60uA
200mH		100uH	200Hz	60uA
2H	$\pm (3\%+5d)$	1mH	200Hz	6uA
20H	$\pm (5\%+15d)$	10mH	200Hz	600nA

uH= micro Henry ( $10^{-6}$  H). mH= milli Henry ( $10^{-3}$  H).

C(Capacitance)				
Range	Accuracy	Resolution	Test Frequency	Voltage across Capacitance under test
2nF	$\pm (2\%+5d)$	1pF	200Hz	75mV
20nF		10pF	200Hz	
200nF		100pF	200Hz	
2uF		1nF	200Hz	
20uF		10nF	200Hz	
200uF	$\pm (5\%+5d)$	100nF	20Hz	

pF= Pico Farad( $10^{-12}$ F), nF= nano Farad( $10^{-9}$ F). uF= micro Farad( $10^{-6}$ F)

Temperature coefficient : Capacitance: $\leqslant 0.5\mu\text{F}-0.1\%/\text{C}$

Zero Error:	>0.5uF-0.2%/°C Inductance: $\leqslant 0.5\text{H}-0.2\%/\text{C}$ Capacitance: $<5\text{pF}$ . Inductance: $<10\text{uH}$ .
Overload Rating:	Protection by a fuse.

## 3. OPERATION

### 3-1.FRONT PANAL DESCRIPTION

1. LCD
2. POWER Switch
3. RANGE Switch
4. Input Jack Terminal

### 3-2.CONSIDERATION OF MEASUREMENT

- (1) This LC METER is intended for measuring the capacitance value of a capacitor, the inductance value of an inductor. It is not intended for determining the "Q" factor for above reactive components. Misleading readings may be obtained if the measurement of the inductance or capacitance of a resistor is attempted.
- (2) When measuring components within circuit that circuit must be switched off and de-energized before connecting the test leads.
- (3) Instruments used in dusty environments should be stripped and cleaned periodically.
- (4) Do not leave the instrument exposed to direct heat from the sun for long periods.
- (5) Before removing the battery and fuse compartment cover, ensure that the instrument is disconnected from any circuit and the power switch is in the off position.
- (6) For all measurements, should connect BLACK test lead into "-" terminal and RED test lead into "+" terminal.

### 3-3. INDUCTANCE (L) MEASUREMENT PROCEDURE

- (1) Set POWER switch to "ON" position.
- (2) Select the range switch for the maximum expected inductance.
- (3) Connect the alligator clips to the inductor leads.
- (4) Read the display. The value is direct reading in the electrical units (uH, H) indicated at the selected switch. If DISPLAY show "1". It indicates on Out-of-Range measurement. If the display indicates one of more reading zeros, shift to the next lower range scale to improve the resolution of the measurement.

#### NOTE:

- (a) If the inductance value is unmarked, start with the 2mH range and keep increasing until the over range indication goes off and a reading is obtained.
- (b) Measure of very low inductance should be performed using extremely short leads in order to avoid introducing any stray inductance.
- (c) This instrument is not intended for determining the "Q" factor for the inductor. Misleading readings may be obtained if the measurement of the inductance of a resistor is attempted.

## 4.CAPACITANCE(C) MEASURING PROCEDURE

- (1) Set POWER switch to "ON" position.
- (2) Select the range switch for the maximum expected capacitance.
- (3) Observe polarity when connecting polarized capacitors.
- (4) Fully discharge any capacitors.
- (5) Connect the alligator clips to the capacitor leads.
- (6) Read the display. The value is direct reading in the electrical unit (nF, uF) indicated at the selected range switch. If DISPLAY show "1", It indicate on Out-of-Range measurement. If the display indicates one or more leading zeros, shift to the next lower range scale to improve the resolution of the measurement.

#### NOTE:

- (a) If the capacitance value is unmarked, start with the 2nF range and keep increasing until the over-range indication goes off and a reading is obtained.
- (b) A shorted capacitor will read over-range on all ranges. A capacitance with low voltage leakage will read over range, or a much higher value than normal.
- An open capacitor will read zero on all ranges (possible a few pF on 2nF range, due to stray capacitance of the instrument).
- (c) Measure of very low capacitance should be performed using extremely short leads in order to avoid introducing any stray inductance.
- (d) When using the optioned test leads, remember that the leads introduce a measurable capacitance to the measurement. As a first approximation, the test capacitance did measured by opening the leads at the trips, recording the open circuit value and subtracting the value.
- (e) Capacitors, especially electrolytic, often have notoriously wide tolerances. Do not be surprised if the measured value is greater than the value marked on the capacitor, unless it is a close tolerance type. However, value is seldom drastically below the rated value.

## 5. MAINTENANCE

- 1) 9-Volt battery replacement
  - a. Ensure the instrument is not connected to any external circuit. Set the selector switch to OFF position and remove test leads from terminals.
  - b. Remove the screw on the bottom case and lift the bottom case.
  - c. Remove the spent battery and replace it with a battery of the same type.
- 2) Fuse replacement
  - a. Ensure the instrument is not connected to any external circuit. Set the selector switch to OFF position and remove test leads from terminals.
  - b. Remove the screw on the bottom case and lift the bottom case.