# New Generation Ring Coil Tester: LCR-Reader-MPA with Coil Test Unit

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A Popular All-in-one Digital Multimeter from Siborg now has option of performing ring test with a new accessory

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LCR-Reader-MPA from Siborg Systems Inc. is an All-in-One Digital Multimeter that offers quick, high accuracy testing for SMT with little or no set-up between measurements. The device has recently added another test option: a Ring Coil Test.

The LCR-Reader-MPA is a lightweight multimeter with 0.1% basic accuracy and a wide range of features including 100 kHz test signal, AC/DC current/voltage testing, Oscilloscope mode, pulse/signal/duty testing, super cap tests and more. The MPA can automatically determine the type of component and best test parameters when set to Auto mode; this is exceptionally helpful when testing unlabeled components. All measurement values, including the main impedance value, secondary values (ESR),

LCR-Reader-MPA Coil Ring Tester

## The new Ring Coil Tester for LCR-

component type, and test frequency are made available almost instantly on the LCD display in the device.

Reader-MPA expands the devices' capabilities with the ability to preform ring coil tests.

Basic inductor or coil tests can be done using any LCR meter, such as LCR-Reader. When testing, if the device shows any reading (or continuity) this shows that the coil winding is not destroyed. Many times, the reading of the coil may show a slight deviation in values that is only detectable by knowing the exact original values of R or L. If there is one or a few turns of the winding that have short, the values would only show a slight variation.

A much more accurate method of finding short turns in a coil is by using the Ring Test method. This method is a tried-and-true method of repairing old-style audio-video equipment that employ flybacks, motors, deflection yoke windings, motors, main transformers, chopper transformers, VCR video and other magnetic heads, and other coils, transformers or inductors.

This method is based on the theory that if a faulty coil or transformer has shorted turn(s) in one of the coils, the Q-factor of the transformer is drastically redacted. When an impulse is applied, a faulty transformer will resonate with a highly damped oscillation while a good one will decay gradually.

When a high quality capacitor is connected across one winding of the investigated device and a pulse is applied to the parallel resonant circuit ,the waveform across the resonant circuit will produce a decaying oscillation, with at least a few cycles if the coil is good. The oscillations will be strongly damped and only complete 1-2 cycles if there is a shorted turn in any of the magnetically coupled coils of the device. A short turn can also be applied, if possible, to compare the behavior with and without the short turn; if there is no change, there must be a shorted turn in at least one coil. Experience and comparison with a known good device will tell you what to expect.

The Ring Coil Tester for LCR-Reader-MPA is connected through the micro-USB port on the device and connects to a coil by the hook connectors.

The MPA device must be set to “winding turns” in the menu. When set, the screen will show the excitation response on the display. Figure 1 shows the difference between testing a working coil (left) and one with a short turn around the coil (right). The example shows the dramatic difference of the display; when a shorted turn is connected, the display shows a significantly higher dissipation factor and therefore a fewer number of oscillations following the impulse on the coil.

LCR-Reader-MPA was introduced in 2019 as a more accurate and versatile option to the LCR-Reader multimeters. The MPA offers more features than any LCR-Reader or Smart Tweezers device, including the aforementioned oscilloscope mode, which hasnt been included on any of Siborg’s devices after Smart Tweezers ST-1.

Recently, Siborg has begun offering a Low-Frequency model of LCR-Reader-MPA and a Bluetoothenabled model. The Bluetooth model connects to PC and Android devices to remotely record measurement values in real time.

MPA Features:

- Test Frequency including 100, 120 Hz, 1, 10, 20, 30, 40, 50, 60, 75 and 100 kHz
- 0.1% basic accuracy
- Fully automatic and manual LCR, ESR, Diode/LED testing
- Easy Open/Short calibration and offset removal
- Large and Super Large capacitance testing to 640 mF
- Signal generator with Sine wave up to 100 kHz
- Test signal levels of 0.1, 0.5 and 1 Vrms
- 3.2 Volt LED test voltage
- Test Signal Reduction to 0.1V for in-circuit measurements
- Signal Generator with Sine wave up to 100 kHz
- Li-Poly battery with micro-USB charging
- 1 oz. weight

Gold-plated test leads

NIST Traceable Calibration certificate available

The LCR-Reader Store offers a wide range of test equipment, accessories and task kits. Siborg's task kits are pre-bundled with a device and accessories;for example, the LCR-Reader-MPA task kit includes the Kelvin Probe Connector which can be used to make LCR-Reader, MPA and Smart Tweezers devices into a probe-station. Siborg also offers their devices on Amazon sales places in North America and Europe.

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