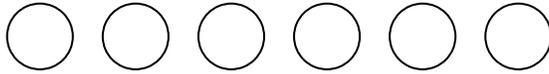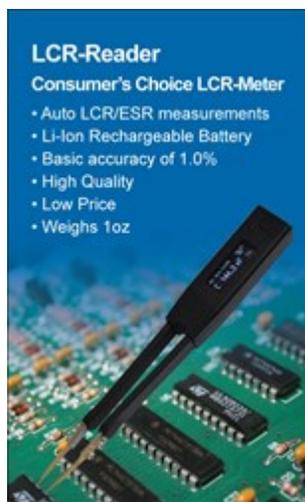# Siborg Systems Inc Review of Smart Tweezers LCR-meter and LCR-Reader: Side-by-Side Comparison

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Siborg Systems Inc present a detailed comparison of features of these two popular model of LCR-meters, pros and cons of the professional LCR-meter Smart Tweezers and newly released Consumer's choice LCR-Reader.

LCR-Reader Akin to Smart Tweezers LCR-meter

Extremely light pen-size LCR-meter for consumer market.

The world first handheld LCR-meter, Smart Tweezers is a small and light-weight tool designed specifically for use in Surface Mount Technology (SMT). By combining a set of tweezer tips, an LCD and an LCR-meter it completely transformed the way to characterize components. One hand operation allows to handle other tools simultaneously. This design appeared successful from the very beginning, and Smart Tweezers are currently used by thousands of electronics engineers and technicians worldwide, including those at leading high-tech companies.

First prototypes of Smart Tweezers were designed back in early 2000s. On the right you can see one of the latest pre-production units that had hand-made tweezer-type probes, and a hand-carved housing and was powered by AA alkaline battery. Quickly changing design environment and evolution the components resulted in a completely new look of Smart Tweezers LCR-meter around 2003 finally when it was looking somewhat close to what it is today. The latest pre-production unit manufactured using 3D printing is shown on the right. ST-1 was the first commercial model of Smart Tweezers in released 2004.

Later significant improvements had been made in both accuracy and mechanical design resulting in model ST-2. Replaceable tweezer tips, that improved the device life-span, had been introduced as well as a better insulation of the handles released in 2007.

In 2009 a rechargeable model ST-3 of Smart was introduced in order to address a problem of housing damage due to multiple replacements of the batteries. This model was more expensive but was widely accepted on assembly lines.

In 2011 the latest model ST-5 had been released featuring even better accuracy and Li-Ion rechargeable

batteries.

One of the problems with Smart Tweezers was the price, varying with a region and resellers from $340 to $700. For companies and professionals using Smart Tweezers, there this is not a major issue, but for an everyday hobbyist, the price is far too high.

In a continuous effort to reduce Smart Tweezers selling price model ST5L was released last year but it appeared to be not that much less expensive and therefore had not affected the market. Eventually last September LCR-Reader had been released that virtually substituted ST5L and had a few major advantages, first of all significantly lower price, weight and size.

LCR-Reader is twice as light as Smart Tweezers ST-5 and powered by Li-Ion rechargeable battery. Its basic accuracy is about 1% which is not as good as that of Smart Tweezers ST5 (0.2%) but exceeds accuracy of previous models of Smart Tweezers.

LCR-Reader is the latest device in Smart Tweezers family of LCR-meters. The new design has a record low weight and size, as well as low price at the same time. This new model maximizes operation simplicity and ease-of-use; complimented with an affordable price while still keeping high basic accuracy of about 1%.

LCR-Reader is not replacing Smart Tweezers ST5 which still remains the model of choice for professionals. Unlike LCR-Reader, the ST5 is supplied with a Calibration Certificate traceable to National Institute of Standards required by all major electronic companies. Besides, ST5 has a significantly higher accuracy of about 0.2% and various features that are not available on the LCR-Reader.

Smart Tweezers LCR-meter ST-5:

- Automatic LCR and ESR Mesurements
- Basic Accuracy 0.2%
- NIST Traceable Calibration Certificate
- Variable Test Signal up to 1Vrms
- Rechargeable Li-Ion Battery
- Weight of 2 Oz (56 grams)
- Diode Test
- Continuity Test
- Component Sorting
- Tolerance Check

LCR-Reader LCR-R1

- Automatic LCR and ESR Mesurements
- Basic Accuracy 1.0%
- Rechargeable Li-Ion Battery
- Weight of 1 Oz (28 grams)
- Fixed Test Signal 0.5 Vrms
- No Calibration Certificate
- No Diode Test
- No Continuity Test
- No Component Sorting

No Tolerance Check

"We are very happy with the LCR-Reader performance and affordability. We hope that the new device will be the LCR-meter of choice for regular consumers," says Michael Obrecht, Director of Research and Development at Siborg Systems Inc. "Therefore we optimized the design to ensure high measurement accuracy and low manufacturing cost before starting production of this device. We have achieved the basic accuracy of 1% while still keeping its suggested retail price below $200 mark."

About Siborg Systems Inc:

Established in 1994, Siborg Systems Inc. is a source of engineering software and hardware tools for semiconductor and electronics industry. Located in the city of Waterloo, Ontario, Canada, it enjoys being part of the local world-renowned high-tech community.

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