

RELIABLE PARAMETER ESTIMATION OF THE SIMPLIFIED Randles Circuit Using Low-Cost Microcontrollers

1.

Our approach is not iterative: it does not require for an initial guess of model parameters to be provided.

2.

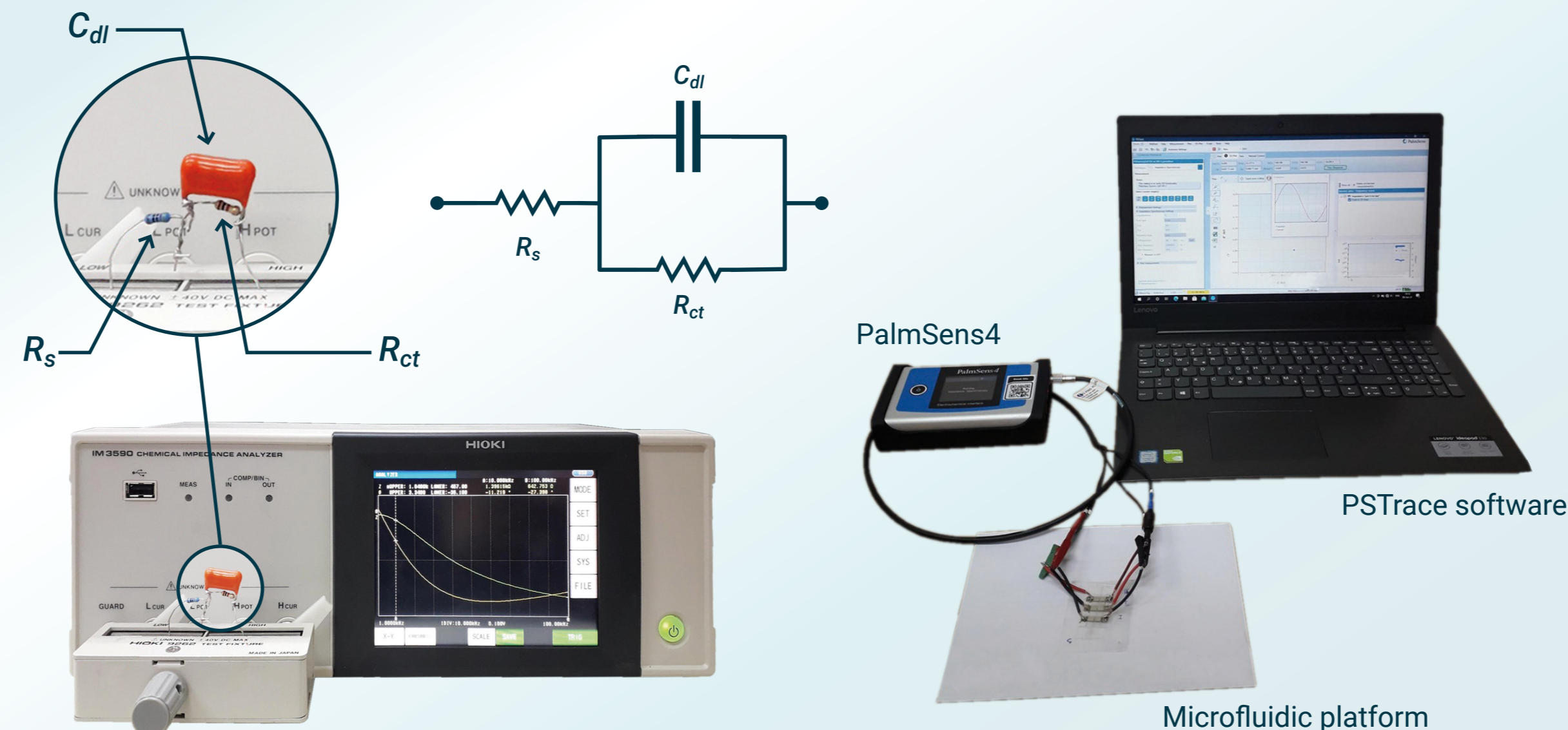
The presented approach is verified with simulations (using both noiseless data and data with noise) and with experimentally obtained data.

3.

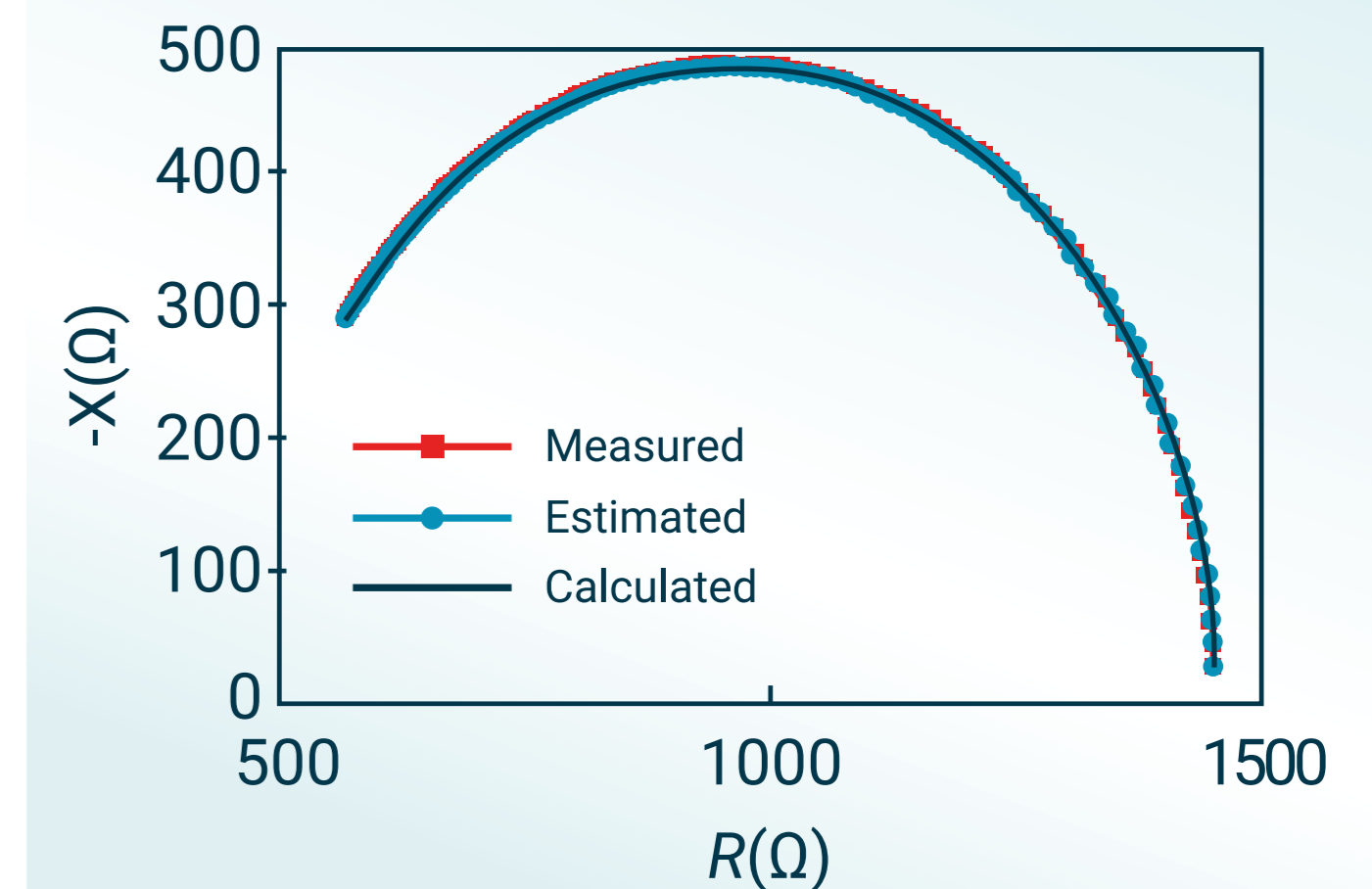
Implemented on low-cost microcontroller 256 kB of flash memory, 8 kB of SRAM and a clock speed of 16 MHz.

Simplified Randles Circuit

$$\underline{Z}(\omega) = R_s + \frac{R_{ct}}{1 + j\omega R_{ct} C_{dl}}$$



Relative errors
lower than 1%.



Presented approach is not limited for use on PC platforms but can also work on microcontroller-based platforms with standard functions of C/C++ compilers.

M. Simić, A. K. Stavrakis, G. M. Stojanović, "A Low-Complexity Method for Parameter Estimation of the Simplified Randles Circuit With Experimental Verification", *IEEE Sensors Journal* (IF2020=3.301), ISSN: 1530-437X, Vol. 21, No. 21, pp. 24209-24217, 2021, doi: [10.1109/JSEN.2021.3110296](https://doi.org/10.1109/JSEN.2021.3110296).