Remote Calibration of Wattmeter in a Low-Voltage AC Network

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Abstract:

This paper presents and compares several algorithms for selecting optimal averaging intervals for short-term power measurements in low-voltage AC networks. These intervals are crucial in reducing the statistical variance of power estimates, which is essential for the remote calibration of wattmeter's and the accuracy of smart sockets. The research focuses on minimizing fluctuations in power consumption data, which are influenced by various network-connected loads. By analyzing different power averaging interval selection algorithms, the study provides a methodology to enhance the reliability and accuracy of remote calibration processes for wattmeter's in dynamic power quality conditions.

The research presents results that demonstrate the effectiveness of different algorithms in minimizing power estimate variance. The findings indicate that specific algorithms are better suited for certain types of power quality conditions, leading to more accurate power measurements. These results support the feasibility of using the proposed methods for remote calibration and provide guidelines for selecting appropriate averaging intervals in practical scenarios.

Keywords:

calibration, electrical grid, power measurement, smart electricity meter, watthour meters