Measurement of Telephone Line Parameters using the Three Voltmeter Method

Abstract

Telecom Egypt Company (TE) is the unique fixed telephone line company in Egypt. Due to the huge demand for high data rates for personals and companies, the performance of the copper network needs to be evaluated to assess its capability for transmitting high data rates to meet the increased demand on data transmission. The most commonly used testing and measuring instrument in TE is "Dynatel 965DSP", which has some drawbacks. This paper introduces a new methodology for measuring the telephone line parameters. This method is based on the three voltmeter method for measuring resistors, capacitor, inductors and vector impedances. This method is automated by using NI-6008 USB data acquisition DAQ card. The frequency range of interest extends from 0.8 KHz to 196 KHz. The experimental results of the transmission line parameters, R, C, characteristic impedance, phase constant and attenuation constant have acceptable accuracy, while the results of the inductance and conductance have errors greater than the acceptable values.


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**Index Terms**

Computer Science  
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**Keywords**

Telecom Egypt company; "Dynatel 965DSP"; Three Voltmeter method; Data Acquisition Card; Telephone line parameters measurement.