

ABSTRACT

The development of inspection technology to detect defects or abnormal conditions of tested objects is through the method of Electrical Impedance Tomography (EIT). EIT detects materials through imaging the distribution of electrical resistivity of an object. The use of weak electrical current sources in EIT is a superior feature of this system. This final project focuses on designing a current source for EIT called Voltage Controlled Current Source (VCCS). The research aims to design the VCCS system, which consists of four parts, namely the Voltage Controlled Oscillator (VCO), filter, amplifier, and Voltage-to-Current Converter (VCC), as well as to test and analyze its performance. The design was carried out using EWB software to determine the electronic circuit configuration and simulate the performance analysis of VCCS. The VCCS was then assembled and tested to obtain the ideal VCCS characteristics. The design successfully produced a good VCCS, which can function as intended, with a current range of 0.27-5.8mA. Therefore, a good combination of sensitivity and safety is required for current distribution on the human body. Therefore, a current of 1mA at a frequency of 650 Hz was determined. The frequency variation given to the VCCS results in a voltage distribution ranging from 0.001 to 0.031 volts, both without anomalies and with anomalies, through air and water media

Keywords: design, current injection system, tomography, VCCS.