ABSTRACT

The most important devices in the EIT is a current source. Current source must be stable and constant, has a range of wide amplitudo and frequency, and easy to use. This research would discuss the configuration of the current source. A current source design using the principle of a voltage-to-current conversion (VCCS) to the AD9850 as a signal generator. This research also compare four VCCS configurations to find the best configuration that will be used. The four configurations are Floating Load, Howland, 2 Op-Amp, and 3 Op-Amp. The final results showed that *Howland* is the best configuration. The parameters used for comparison are loading response, output impedance, and frequency response. Howland has a wider range of load that is $10\Omega - 24.4 \text{ k}\Omega$, has 1Hz - 293.2 kHz, and has a value of 364.31 k Ω output impedance. The results showed that the amplitude characteristics 1 mApp maximum load that can be applied at 24.4 k Ω . When the amplitude is 1 mApp, the outure impedance of the circuit is $466.910 \text{ k}\Omega$ and maximum load that can be reached is 24.4 k Ω . When the amplitude is 10 mApp, the ouput impedance of the circuit is 325.692 k Ω and maximum load that can be reached is 1.648 k Ω . Current source also works in 1 Hz – 288.7 kHz. At the end of the study, the current source is also tested at four objects EIT. Objects EIT is 13cm x 13cm on the ground with homogeneous conditions and anomalies. From the observation, the current source can be used to the object of EIT with an error 8%. With i a small value of the error, the reconstruction process can be carried out with better results.

Keywords: EIT, Applied Current, VCCS, AD9850, Howland, Floating Load, 2 Op-Amp, and 3 Op-Amp