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 10Ω - 24.4 kΩ, has 1Hz - 293.2 kHz, and has a value of 364.31 kΩ output impedance. The results showed that the amplitude characteristics 1 mApp maximum load that can be applied at 24.4 kΩ. When the amplitude is 1 mApp, the ouput impedance of the circuit is 466.910 kΩ and maximum load that can be reached is 24.4 kΩ. When the amplitude is 10 mApp, the ouput impedance of the circuit is 325.692 kΩ and maximum load that can be reached is 1.648 kΩ. 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*