

## ABSTRACT

This study aims to make a potentiostat with automatic voltage gain in the transimpedance circuit for electrochemical test purposes with the ability to provide input voltages of 10mV/second, 100mV/second, and 1V/second, all of which have the same peak voltage of 1V, the input is connected to a circuit. a potentiostat connected to a test resistor that functions as a working electrode (WE), reference electrode (RE), and a counter electrode (CE). the method used is cyclic voltammetry. The result that reads this potentiostat is a current whose range is determined automatically by the voltage gain in the transimpedance circuit from 10 Amperes to 0.01 Ampere, the voltage gain regulator component in this circuit is a digital potentiometer type X9C104 which has a resistance value of 100 k $\Omega$  and a resistance value of 1 k $\Omega$  for each the steps, the total steps on the X9C104 are 100 and are programmed using a microcontroller so that the objectives of this research can be achieved. The value of the data read by the Potentiostat is displayed in a graphical user interface (GUI) made using the visual studio application, this application is not only able to display graphic data but can control the input scan rate in research and adjust the resistance on the digital potentiostat automatically and manually. In the potentiostat test, tests were carried out using several resistor values, namely 100, 680, 1 k $\Omega$ , 100 k $\Omega$ , and 1 M $\Omega$ . the results of this test obtained that the current value is measured and adjusted automatically when data collection with a resistor whose value is 1 M $\Omega$  which produces a current range below 1 A cannot be measured. But for the measurement range or other test resistor values get the current measurement results according to the calculation.

**Keyword** : *potensiostat, automatic voltage gain, electrode test, transimpedance*