

## ***ABSTRACT***

Increasingly widespread the use of motors in electronic equipment, for different applications require different motor power at an early design stage electronic tools. Mechanic that uses the motor as the driving tool is needed an accuracy to capable equipment of running as wanted. One of the issue that is often arises is if the motor used is not equipped with specifications such as power motors, the nominal speed, maximum current and maximum torque. Beside that, a necessity of torquemeter will be using for experiment at Power Electrical Laboratory become one of main factors in this last assignment.

Therefore, the final project will be designed torque-meter based on microcontroller with keypad input that will be displayed by LCD. Microcontroller ATmega8535 is used as the main processor. The function of keypad is for user interface so they can choose measurement mode such as torque (Nm), voltage (V), current (A), speed (rpm). DC Multifunction Machine Motor is used for the experiment of designed torque-meter. The particular approach to be able to measure motor torque can be done by measuring the amount of power and the speed. This project using thevenin method, differential amplifier and Hall effect in a series of electrical design with series excitation for the motor.

From the experimental results obtained reinforcement series motor current sensor accuracy rate reached 98.77% with an error limit of  $K = \pm 0.16\% - \pm 0.2\%$ . Accuracy on the sensor voltage reaches 99.85% with precision  $P = 1 - K = \pm 99.92\% - \pm 99.87\%$ . The sensor produces an error rate of 2.2321% and the measurement of torque produces an error of 1.8794%.

*Keyword: Torque, microcontroller, differential amplifier, DC Multifunction Machine*