

## ABSTRACT

Speed control is a measurement process or control of a magnitude that is a desired price. In Basic Control System Laboratory, there are practicum module is a DC servo motor velocity control. At that plant, how the velocity of the DC servo motor controlled with PID control (Proportional, Integral, and Derivative) against a desired price. At the end of this final has been designed an application control and measurement with a data acquisition device Daqboard/1005 series based on PC.

The selection of data acquisition using device Daqboard/1005 series because it can observe the analog signal output plant response that can be observed and shown into PC with a readout signal is  $5\mu\text{s}$ . PC will send a set point voltage to the servo amplifier to drive the DC servo motor based on the given value and then acquired and analyzed to determine the transfer function of a DC servo motor module in the GUI (Graphic User Interface).

Transfer set point voltage is capable of delivering value from 0-10V via serial communication with a constant value and signal. Acquisition of data that has been designed in a GUI can measure the value and the signal set point with accuracy rate 99.2465% and the output of a DC servo motor with a level of accuracy and precision of set point 0.5 V is 97.65% and 99.8677%, the output of the set point 1.5 V is 99 984 % and 99.67%, and the output of 5 V set point is 99 685% and 99.9834%. The results PID process with set point 4.3V using the approximate first-order transfer function obtained  $K_p = 13:04$ ,  $K_i = 0.03$ ,  $K_d = 0.0075$  so it can improve the response time with the fastest settling time is 0.0736 second, but without PID controller settling time is 0.7 second ( $K_p = 1$ ,  $K_i = K_d = 0$ ) and the fastest rise time is 0.0105, but without PID controller rise time is 0.5 seconds ( $K_p = 1$ ,  $K_i = K_d = 0$ ).

**Keywords: DC Servo Motor, Control, PC, Data Acquisition, PID, GUI**