

## ABSTRACT

Increasingly widespread use of wireless networks in a variety of applications. For example in industrial automation, building automation, home and office automation, and complex systems on aircraft and spacecraft. The use of wireless media to control an object has advantages in terms of practicality and ease of care. But on the other side also has shortcomings in terms of data accuracy and data communication disruption due to noise on the transmission system. Though, the accuracy of the data is an important aspect that must be considered in the design of control systems. Therefore, we need a good system design in order to use the wireless network control system does not give effect to interfere with the performance of the control system. On this Final Project has designed a rotary motor velocity control system with a wireless media based Personal Computer (PC) as a controller with a PID as control algorithm method.

The use of PC as the controller based on the ease of operation by the user's way. Moreover PC has an advantage in speed and accuracy of data processing compared to a microcontroller or FPGA. With MATLAB simulink software designed a wireless velocity control system where the user can specify the setpoint, observing the system response, and tune the constants of PID in real time.

Setpoint can be given user in range from 0 to 1820 rpm. With the type of UART serial communication, setpoint data transmitted over wireless media using a ZIG-100 RF modules. The setpoint data is an instructions for the controller in order to maintain the stability of the motor velocity at a desired setpoint by a user either when the motor is operating at no load or with the load. By trial and error method of tuning PID constants obtained the value of  $K_p = 0.5$ ,  $K_i = 1$ , and  $K_d = 0.01$ . From the test results proved that the designed control system capable of maintaining the stability of the motor velocity according to the desired setpoint by a user.

Keywords: Wireless Network Control System (WNCS), Control, PID, MATLAB