ABSTRACT

The application of instruments and control systems in the industrial sector has an important function as measuring device, the value of the variable is desired. The control system very necessary for the processing, the process can operate optimally. The operation of the industrial sector very dependent on the measurement and control of a quantity in process. One of the values of the quantities that are processed to be measured and controlled is the water level as a reference for capacity.

This final project describes the system and control of water level in a closed tank. The control method on the system created and studied is Proportional Integral Derivative (PID). The use of PID control makes efficient and stable system. The design of the system is by installing an ultrasonic as height meter and motor which is regulated by motor driver. All control processes use the NodeMCU ESP8266 microcontroller. In addition, this research also makes MIT applications then can be operated remotely.

The PWM to operate the pump motor is 0-1023 converted to 0-255 with a maximum voltage of 12V DC. With the PID that have been tested is Kp=146, Ki=20, Kd=13 via MATLAB there has overshoot 7.3% under setpoint conditions that can affect the required PWM value. Water conditions are detected 1 cm, the PWM will be large and decrease slowly when the water level approaches the set point of 13 cm. Testing under undisturbed conditions to obtain the height adjusted required 53.15 seconds and 78.45 seconds under disturbed conditions.

Keywords: *Water Level, Ultrasonic Sensor, PID Control System*