

## ***ABSTRACT***

### **Design and Construction of Water Discharge and Turbine Rotation Monitoring System in Piko Hydro Power Plant Prototype**

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This research aims to design and build a monitoring system for water discharge and turbine rotation on the Piko Hydro Power Plant prototype using the Water Flow Meter YF-DN50 sensor and the Hall Effect Proximity NJK-5002C sensor based on the Arduino ATmega 2560. The research method used is an experimental method with stages of system design, microcontroller programming, tool testing, data analysis. Static characteristic testing is carried out by comparing the results of sensor readings to standard measuring instruments. Water discharge measurements use the volumetric method with a bucket and stopwatch as validators, while turbine rotation measurements use a standard digital tachometer. Test data was taken in the morning, afternoon and evening for three days of testing. The research results show that the monitoring system has been successfully designed and is able to display water discharge and turbine rotation in real-time via a 4x20 LCD. The YF-DN50 Water Flow Meter sensor has an accuracy level of between 95.93% to 100% with an error below 5%. The highest average accuracy value was 99.55% with an error of 0.45%. The NJK-5002C Hall Effect Proximity sensor has an accuracy level of between 97.05% to 99.92% with an error below 3%. The highest average accuracy value was 99.28% with an error of 0.72%. The test results also show that the highest water discharge tends to occur in the afternoon with an average value of 2.34 L/s. Based on the research results, it can be concluded that the designed monitoring system is able to work well and is suitable for use to

monitor water discharge and turbine rotation on the Piko Hydro Power Plant prototype in real-time.

**Keywords** : PLTPH, Monitoring, Water Discharge, Turbine Rotation, Arduino ATmega 2560, Water Flow Meter YF-DN50, Hall Effect NJK-5002C.