

## ABSTRACT

With so many bio diversities owned by Indonesia, one of them is ornamental fish species at least 240 species of marine ornamental fish and 226 species of freshwater ornamental fish from the rare until that can be sold in the fish market. As well as business development and ornamental fish enthusiasts are growing and increasing. So required a system of maintenance and supervision of ornamental fish in an aquarium that can reduce the potential number of fish stress and disease commonly experienced by ornamental fish and can increase enthusiasts cultivation of ornamental fish.

This can be overcome either by regular monitoring of aquarium indicators, such as; pH value, water temperature, turbidity level in the aquarium according to their natural habitat. Using ATmega 328P microcontroller located in Arduino Uno™ to control the heater, fan cooler, and solenoid faucet. ESP12-E is used for microcontroller communication with *Firebase*. Microcontroller gets input from sensor pH probe v1.1 to know pH value, turbidity sensor module SKU A05010 to know turbidity level and DS18B20 digital sensor to know a value of temperature. The interface between the tool and the user is an application based on the Android operating system. Android will read the values contained in *Firebase* and will be displayed on the user's smartphone.

From the test results obtained control and supervision of pH value automatically can be done with an average time average of 2.43 minutes. Control and temperature control with an average temperature rise of 0.0625 °C per 61.75 seconds. The value of each sensor can be sent to *Firebase* with an average delivery time of 1.38 seconds. Control and supervision of aquarium cleaning can be done manually by the user through the Android app with an average response time of 1.417 seconds (drain) and 7.47 seconds (stand-by). So the user can know the values of measuring indicators on android smartphone continuously.

Keywords: Arduino Uno™, ESP12-E, pH, turbidity, DS18B20