

**UNIVERSITI TEKNOLOGI MARA  
KOTA SAMARAHAN**

**FINAL YEAR PROJECT**

**(EEE368)**

**AQUARIUM MONITORING SYSTEM**

**Prepared by :**

**ABANG MUHAMAD HAFIZUL BIN DRAHMAN**

**SUPERVISOR : MUHD FIRDAUS MUHD YUSOFF**

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## **ABSTRACT**

To enhance the maintenance and care of aquarium habitats we present the ESP8266 microcontroller Aquarium Monitoring System as part of our project. This system incorporates three sensors, for water quality testing. The first sensor accurately measures the water level providing readings. The second sensor, which combines a 4.7kOhm resistor and temperature sensor enables monitoring of water temperature. Determining water acidity is made possible by the sensor, a pH meter V1.1 equipped with a pH level sensor. These sensors collect data that is seamlessly transmitted to a Blynk mobile application offering real time insights into the aquariums condition for users. Additionally, through the Blynk app owners can remotely control a servo motor to automate feeding. By integrating these sensors and control mechanisms we provide aquarium enthusiasts with a monitoring solution that empowers them to actively manage and improve their environment. The user friendly interface of Blynk fosters a healthier and more balanced habitat for life by enabling owners to control and optimize their aquarium settings based on data driven insights. In conclusion this Aquarium Monitoring System offers a tool for hobbyists to effectively manage their aquariums with features such, as remote access and data driven insights.

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# CHAPTER 1

## INTRODUCTION

### 1.1 RESEARCH BACKGROUND

An aquarium monitoring system combines multiple sensors to guarantee the water's quality. Furthermore, a servo motor was incorporated into this device to serve as a pet feeder for the aquarium's fish. With their busy schedules, many fish hobbyists nowadays struggle to remember to feed their fish, which can lead to common mistakes. The notion of using a servo motor as a pet feeder and an ESP8266 to regulate it was developed by aquarium hobbyists as a solution to this issue [1].

To guarantee the water's quality, new features have been incorporated to this system that make use of many sensors. To measure the aquarium's water level, a water level sensor was added. In addition, a temperature sensor was included to gauge the water's temperature in the aquarium. Lastly, a Ph level sensor was installed to gauge the water's acidity. Through ESP8266, the owner's phone's Blynk app will display the data gathered by the sensors.

In summary, the owner will have sufficient information on the water quality of the aquarium thanks to these features. They'll find it simpler to preserve the water's quality and the fish's survival. Additionally, the issue of feeding fish can be resolved because pet owners can operate the feeder with a phone.

## CHAPTER 2 LITERATURE REVIEW

### 2.1 Circuit Review

This subtopic is about the comparing few circuits that have a different types of sensors, connections and component but have a similar project objective. The purpose of the comparing those circuits is to get the correct circuit that can works properly when it combined with other circuit.

#### 2.1.1 Water Level Sensor Circuit review 1

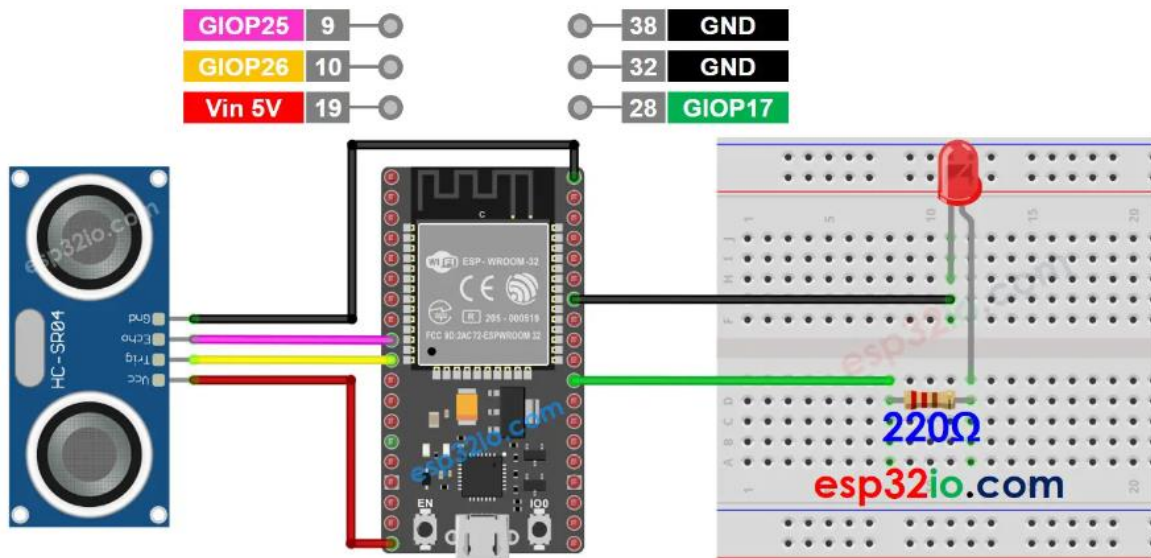


Figure 2.1.1 : Water Level Sensor Circuit [5]

The circuit in Figure 2.1.1 comprises three primary components which are 220-ohm resistor functioning as a voltage divider, an HC-SR04 sensor for water detection, and an ESP32 microcontroller. In this project, the referenced circuit diagram serves as a blueprint to create a water level sensor using different components. Specifically, a US-100 serves as the water level sensor, a 10k-ohm resistor for the voltage divider, and an ESP8266 microcontroller are utilized.