

# Innovative Aquatic Cultivation

embedded systems workshop

# Motivation

- Irregular Fish feeding results overfeeding or underfeeding. can lead to diseases
- Release of ammonia into the water necessitates manual intervention for feeding
- Closed Aquarium leads to scarcity of oxygen. sometimes overdose of oxygen also affects fish's aquaculture
- The consistent growth of bacteria, coupled with fluctuations in pH levels, contributes to diminished fish productivity
- Temperature and light play significant roles. Instances of changing water composition also pose threats to the survival of the fish population.



# How our team go about it ?

- Our proposed solution revolves around the implementation of an automated fish feeding system, aimed at addressing the issues of overfeeding, nitrogen release etc.
- We measure dissolved oxygen and provide natural oxygen using aeration techniques.
- Additionally, we will monitor various parameters such as pH, Total Dissolved Solids (TDS), and temperature readings to assess the stress levels experienced by the fishes.
- We give control access to the user accordingly. And we provide important data to the user.
- (optional) We are considering the incorporation of a robotic arm to extend the lifespan of the water sensors



# Work Division



## Hemanth

- OM2M
- ThingSpeak
- DO Sensor

## Rohan

- pH Sensor
- Table Top
- Frontend

## Jakeer

- Table Top
- IR for TDS

## Susheel

- Servo Motor
- Temperature
- Aeration

# TimeLine



TDS, Table Top

## 4th Week

Aeration, frontend

## 5th Week

TDS, Servo Motor,  
Table Top

## 3rd Week

Aeration, frontend,  
OM2M, Thingspeak

## 6th Week

DO, Temperature  
Sensors

## 2nd Week

IR, pH Sensors

## 1st Week

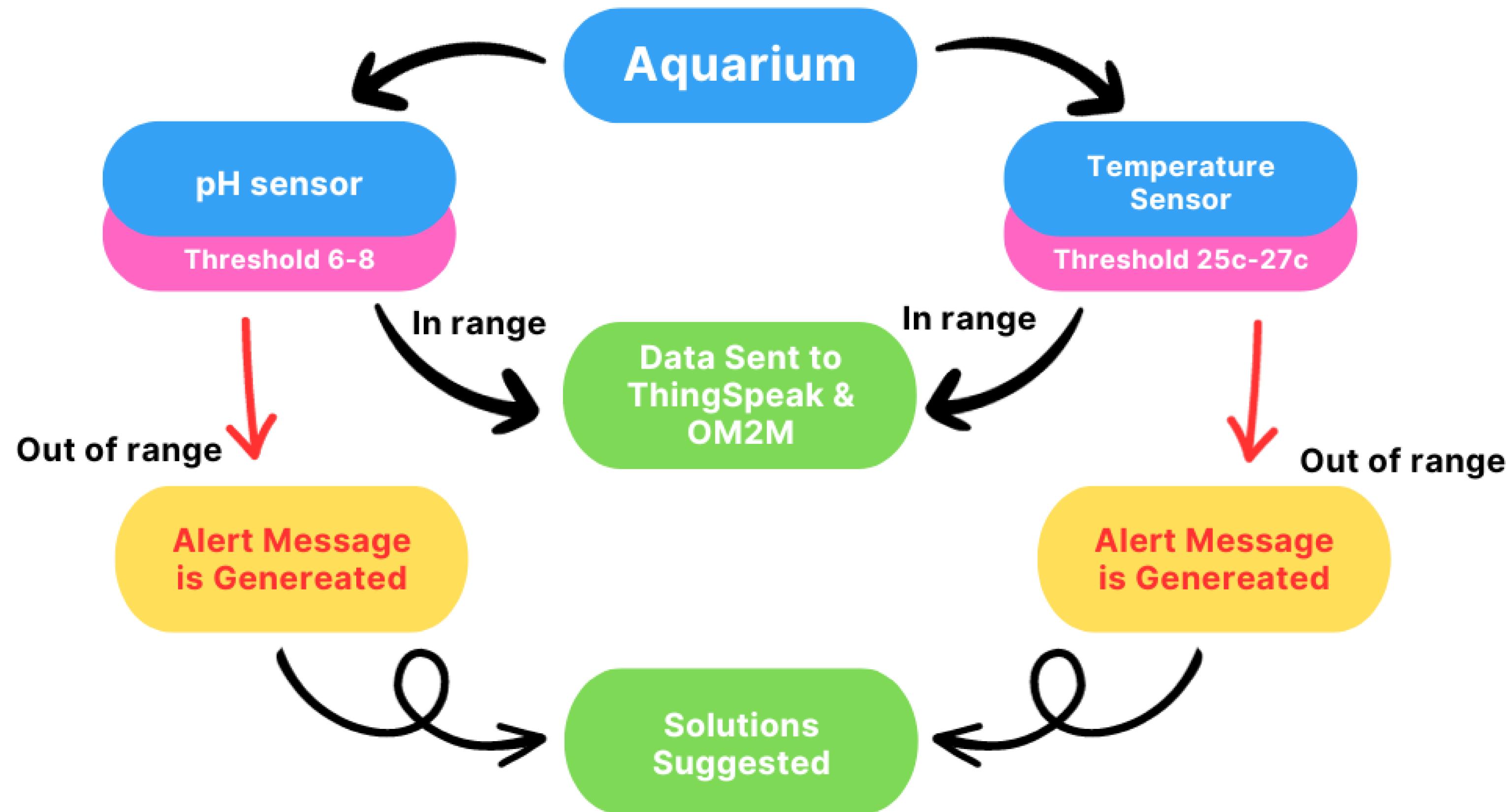
OM2M, Thingspeak

## 7th Week

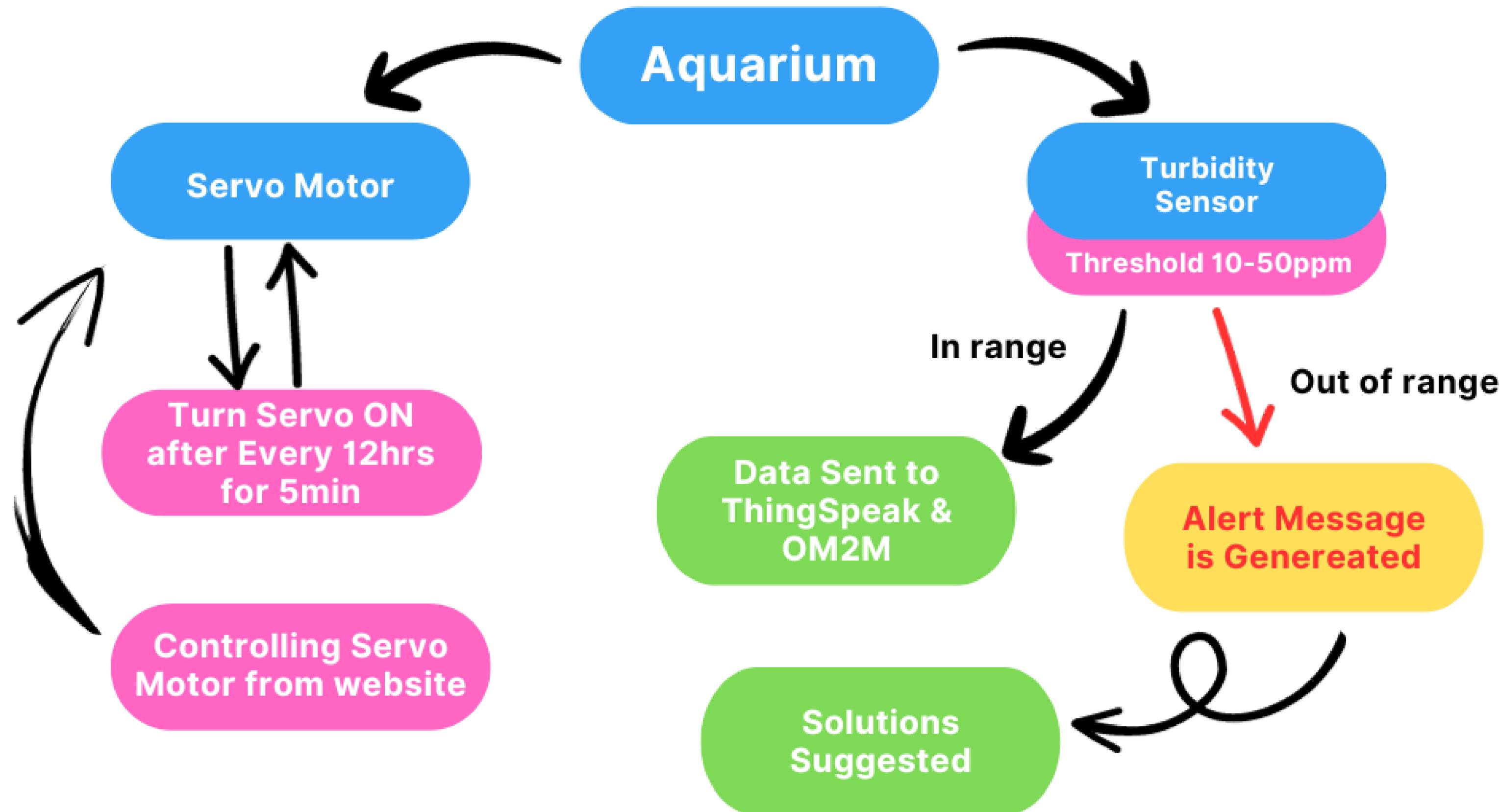
Complete Table Top,  
Data Communication

## BUFFER

# Block Diagram



# Block Diagram



# List of Requirements



## Sensors

- pH sensor
- Temperature Sensor
- TDS sensor (IR light)
- Dissolved O<sub>2</sub> sensor

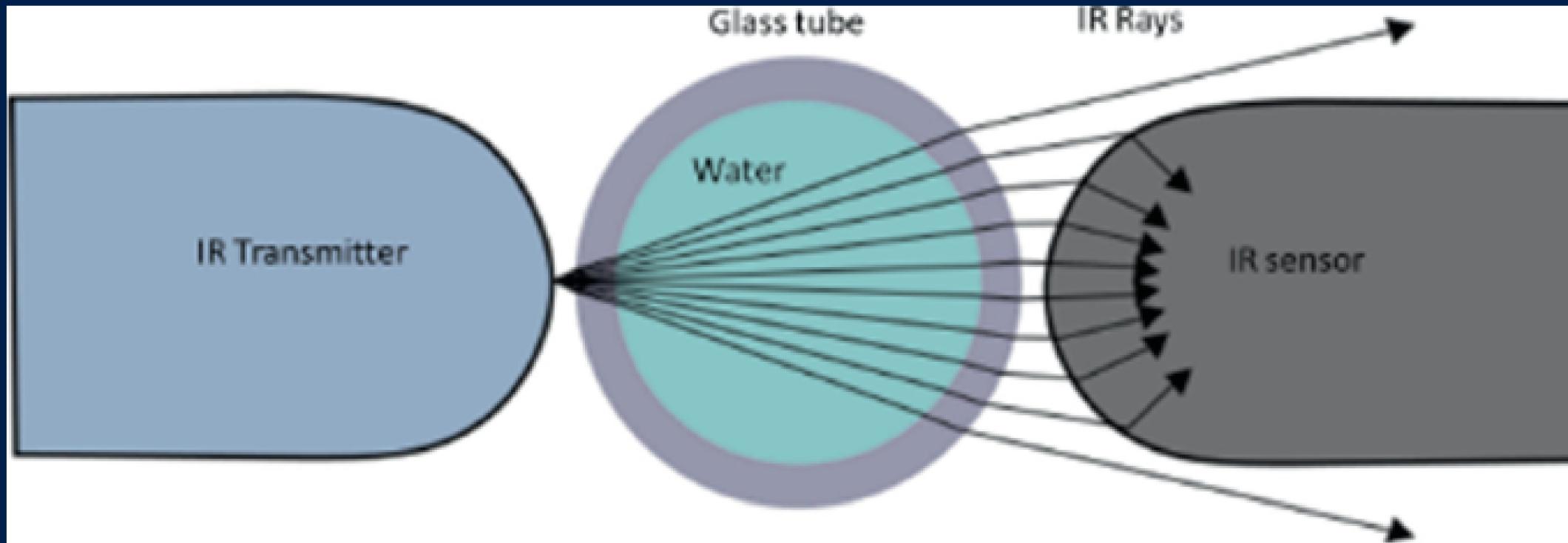
## Actuators

- Servo Motor

## Components

- container

# Measuring TDS with IR light



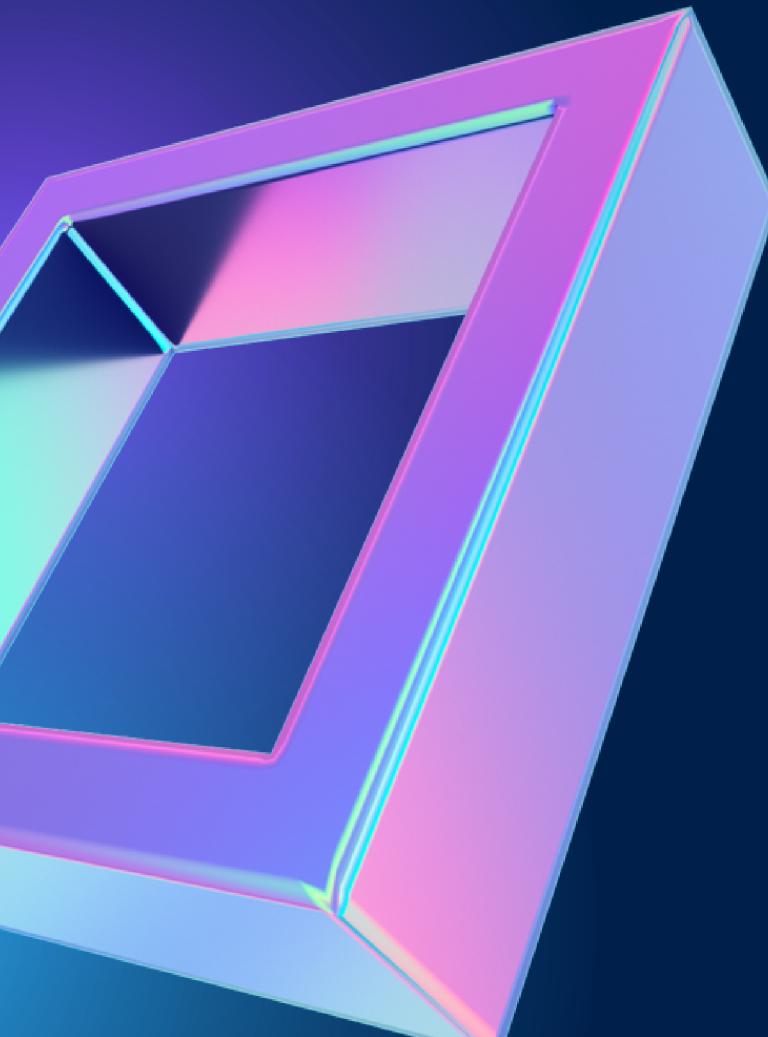
- . When IR light encounters an object ,the object absorbs some or all of the IR light.
- . Sensor contains detector that detects the transmitted IR light.
- . The transmitted IR wavelengths are analyzed to determine the concentration of substances

# pH Sensor



## Principle:

The pH probe contains two electrodes, one reference electrode and other, pH sensitive electrode, which contain an electrolytic solution. By calculating H<sup>+</sup> concentration and comparing with pH sensitive electrode, we can tell whether it is acidic or basic.



# Thank You