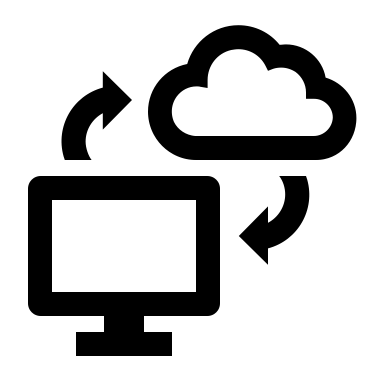
**Aquaponics Fish Pond IoT System Infrastructure Diagram**



Sump Tank

External Antenna

Wired

Serial Data

Wired

Serial Data

Wired

Serial Data

Wired

Serial Data

Wired

Serial Data

Lead

Lead

Lead

Lead

Lead

Filtration System

Hydroponic Unit

ADC

5. Sensor

MQ-137 Ammonia Sensor

6. Sensor

MQ-135 Nitrate

Sensor

4. Sensor

DF Robot pH V2.2

SEN0161-V2

3. Sensor

DF Robot Dissolved Oxygen SEN0237

2. Sensor

DF Robot Turbidity SEN0189

HTTP

TCP/IP

External RAM

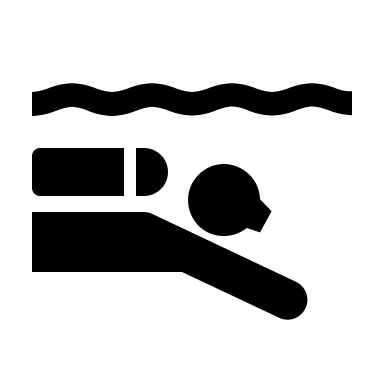
ESP 32 MCU integrated with WIFI and Bluetooth

1. Sensor

Dallas Instrument Temperature DS18D20

Measure temperature in the Air

Lead

Fish Pond



**Reference Documentation**

**Aquaponics Fish Pond IoT System:**

**1. Dallas Instrument Temperature sensor (DS18B20):**

a) Communicates over one-wire bus communication

b) Power supply range: 3.0V to 5.5V

c) Operating temperature range: -55ºC to +125ºC

d) Accuracy +/-0.5 ºC (between the range -10ºC to 85ºC)

**2. DF Robot Turbidity (NTU value) sensor (SEN0189):**

a) Operating Voltage: 5V DC

b) Operating Current: 40mA (MAX)

c) Response Time: <500ms

d) Insulation Resistance: 100M (Min)

e) Output Method: Analog

f) Analog output: 0-4.5V

g) Operating Temperature: 5℃~90 ℃

**3. DF Robot Dissolved Oxygen sensor (SEN0237):**

a) Type: Galvanic Probe

b) Detection Range: 0~20 mg/L

c) Temperature Range: 0~40 ℃

d) Response Time: Up to 98% full response, within 90 seconds (25℃)

e) Pressure Range: 0~50 PSI

f) Electrode Service Life: 1 year (normal use)

g) Maintenance Period:

i. Membrane Cap Replacement Period:

1. 1~2 months (in muddy water);

2. 4~5 months (in clean water)

ii. Filling Solution Replacement Period: Once every month

**4. DF Robot pH sensor V2.2 (SEN0161-V2):**

a) Supply Voltage: 3.3~5.5V

b) Output Voltage: 0~3.0V

c) Measurement Accuracy: ±0.1@25℃

d) Detection Range: 0~14

e) Temperature Range: 5~60°C

f) Zero Point: 7±0.5

g) Probe Life: >0.5 year

**5: MQ-137 Ammonia sensor:**

**6. MQ-135 Nitrate sensor:**

a) Operating Voltage is +5V

b) Digital output voltage: 0V or 5V (TTL Logic)

c) Preheat duration 20 seconds