**Power Consumption and Battery Life Calculations**

**Power Consumption of Each Component**

**Ultrasonic Sensor (HC-SR04)**

* **Active Current**: 15 mA for 10 ms (0.01 seconds)
* **Idle Current**: 0 mA
* **Duty Cycle**: 0.01 / 60 = 0.000167
* **Average Current**: 15 mA × 0.000167 = 0.0025 mA

**Moisture Sensor**

* **Active Current**: 35 mA for 1 second
* **Idle Current**: 0 mA
* **Duty Cycle**: 1 / 60 = 0.0167
* **Average Current**: 35 mA × 0.0167 = 0.5845 mA

**Temperature Sensor (DHT11)**

* **Active Current**: 2 mA for 1 second
* **Idle Current**: 0 mA
* **Duty Cycle**: 1 / 60 = 0.0167
* **Average Current**: 2 mA × 0.0167 = 0.0334 mA

**LED**

* **Active Current**: 20 mA for 1 second
* **Idle Current**: 0 mA
* **Duty Cycle**: 1 / 60 = 0.0167
* **Average Current**: 20 mA × 0.0167 = 0.334 mA

**Relay**

* **Active Current**: 90 mA for 1 second
* **Idle Current**: 0 mA
* **Duty Cycle**: 1 / 60 = 0.0167
* **Average Current**: 90 mA × 0.0167 = 1.503 mA

**LCD Display with I2C Module**

* **Active Current**: 25 mA (continuous operation)
* **Idle Current**: 0 mA (always on)
* **Average Current**: 25 mA

**Total Power Consumption**

The total average current draw is:  
0.0025 + 0.5845 + 0.0334 + 0.334 + 1.503 + 25 = **27.4574 mA**

**Battery Life Calculation for 10,000 mAh Power Bank**

**Effective Capacity (85% Efficiency)**

10,000 mAh × 0.85 = 8,500 mAh

**Battery Life**

* **Battery Life (hours)**: 8,500 / 27.4574 ≈ 309 hours
* **Battery Life (days)**: 309 / 24 ≈ 12.88 days

**Water Pump (Powered by 700 mAh 5V Battery)**

**Power Consumption of the Pump**

* **Active Current**: 300 mA
* **Running Time**: 5 seconds every 5 hours
* **Duty Cycle**: 5 / (5 × 3600) = 0.000278 (or 0.0278%)
* **Average Current**: 300 mA × 0.000278 = 0.0834 mA

**Battery Life Calculation**

* **Battery Capacity**: 700 mAh
* **Battery Life (hours)**: 700 / 0.0834 ≈ 8,392 hours
* **Battery Life (days)**: 8,392 / 24 ≈ 350 days

**Final Summary**

**Main System with 10,000 mAh Power Bank**

* **Components**: Ultrasonic sensor, moisture sensor, temperature sensor, LED, relay, LCD display
* **Total Average Current**: 27.46 mA
* **Battery Life**: ~12.88 days

**Water Pump with 700 mAh Battery**

* **Average Current**: 0.0834 mA
* **Battery Life**: ~350 days