ALAMSCN AL12692

ALAMSCN AL12692 Automatic Irrigation DIY Kit Instruction Manual

Model: AL12692

Introduction

This manual provides comprehensive instructions for setting up, operating, and maintaining your ALAMSCN Automatic Irrigation DIY Kit. This kit allows you to build an automatic watering system that monitors soil moisture and waters plants as needed, ensuring efficient plant care.

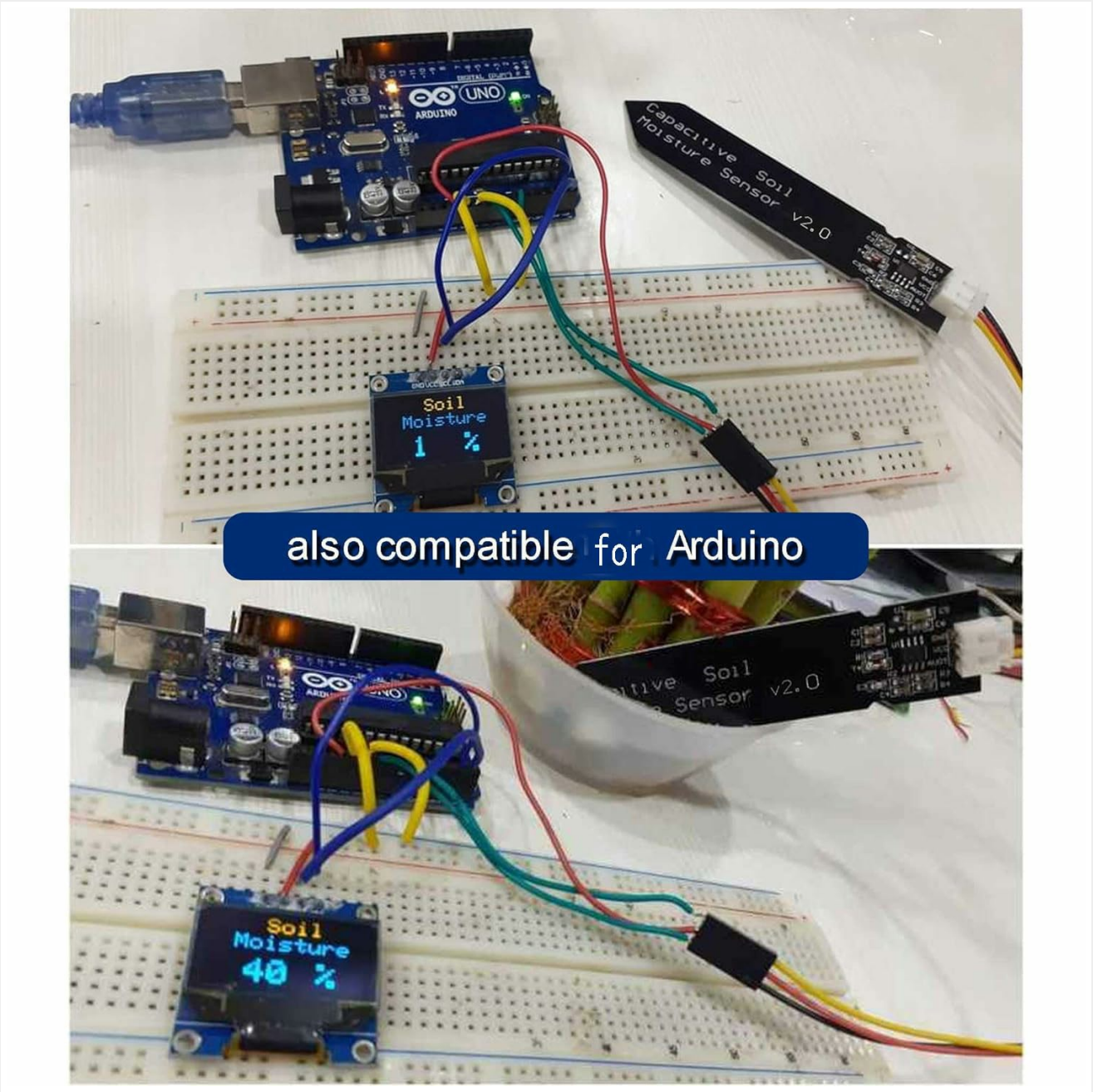

Image: Kit Components in Operation. This image displays the ALAMSCN Automatic Irrigation DIY Kit components, including the capacitive soil moisture sensor, OLED display, and an Arduino board, connected and actively monitoring soil moisture. This setup demonstrates the kit's compatibility with Arduino for building a self-watering system.

Kit Components

The ALAMSCN Automatic Irrigation DIY Kit includes the following components:

- **Capacitive Soil Moisture Sensor:** Measures soil moisture levels using capacitive sensing.
- **DHT11 Sensor:** A digital sensor for measuring ambient temperature and humidity.
- **0.96" I2C OLED Display:** For visualizing data from the sensors.
- **1 Channel 5V Relay Module:** Used to control the water pump.
- **DC 3-6V Micro Submersible Mini Water Pump:** For delivering water to plants.
- **1 Meter Water Tubing:** For water delivery.
- **9V Power Clip:** For power supply.
- **Breadboard:** For prototyping and circuit assembly.
- **Jumper Wires:** For making electrical connections.

Note: An ESP8266 microcontroller (e.g., NodeMCU) is required for this project but is not included in this kit.

Setup Instructions

1. Circuit Diagram and Connection

Follow the diagram below to connect the components.

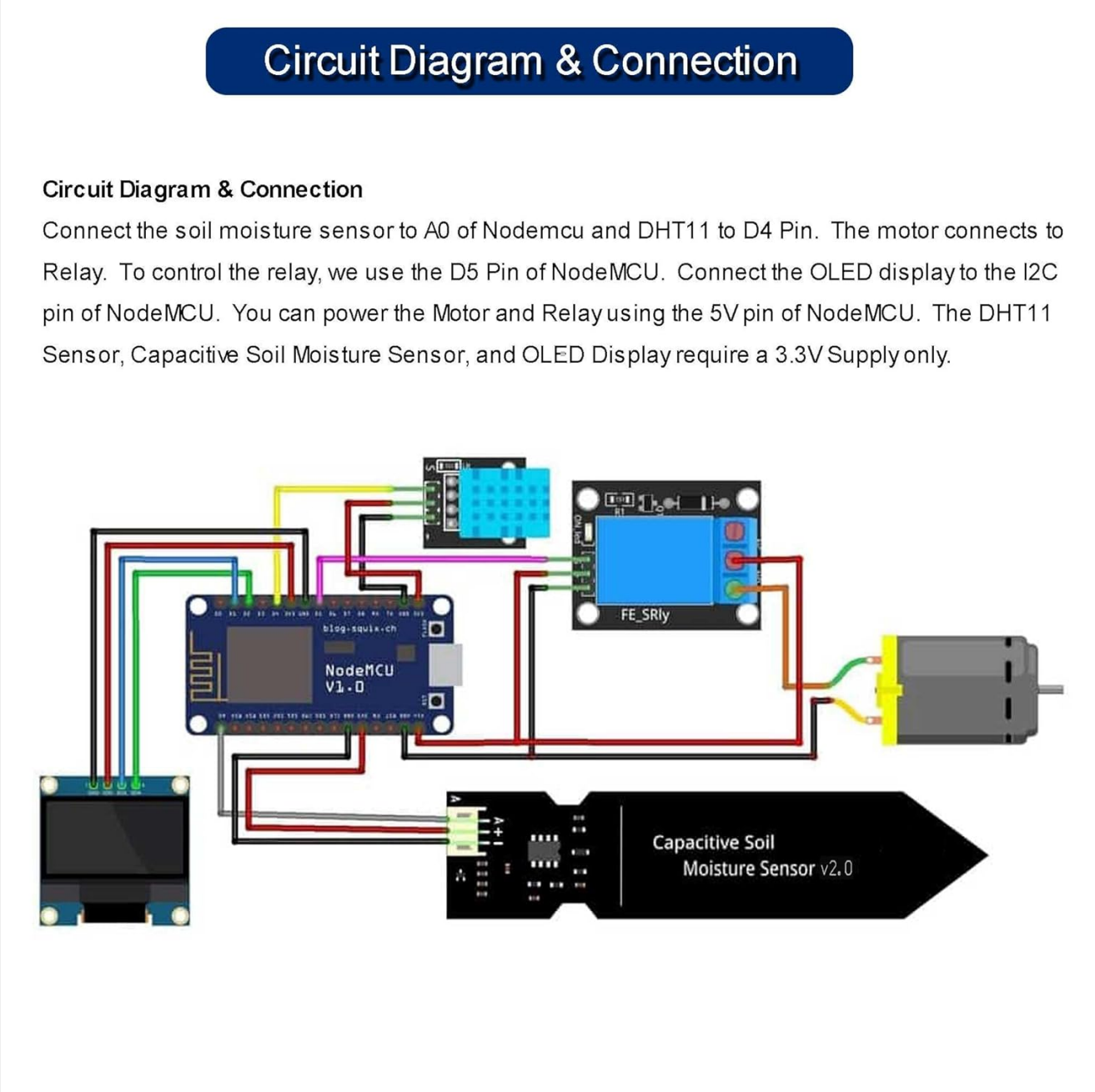

Image: Circuit Diagram and Connection. This image illustrates the wiring connections for the automatic irrigation system. The soil moisture sensor connects to A0 of NodeMCU, the DHT11 to D4 Pin. The motor connects to the Relay, which is controlled by the D5 Pin of NodeMCU. The OLED display connects to the I2C pins of NodeMCU. The motor and relay can be powered by the 5V pin of NodeMCU, while the DHT11, Capacitive Soil Moisture Sensor, and OLED Display require a 3.3V supply.

- Connect the soil moisture sensor to the A0 pin of your NodeMCU (or compatible microcontroller).
- Connect the DHT11 sensor to the D4 pin of your NodeMCU.
- Connect the motor to the relay module.
- Connect the relay module's control pin to the D5 pin of your NodeMCU.
- Connect the OLED display to the I2C pins (SDA, SCL) of your NodeMCU.

- Power the motor and relay using the 5V pin from your NodeMCU.
- Ensure the DHT11 Sensor, Capacitive Soil Moisture Sensor, and OLED Display receive a 3.3V supply.

2. Capacitive Soil Moisture Sensor Installation

The capacitive soil moisture sensor is designed for long-term use due to its corrosion-resistant material.

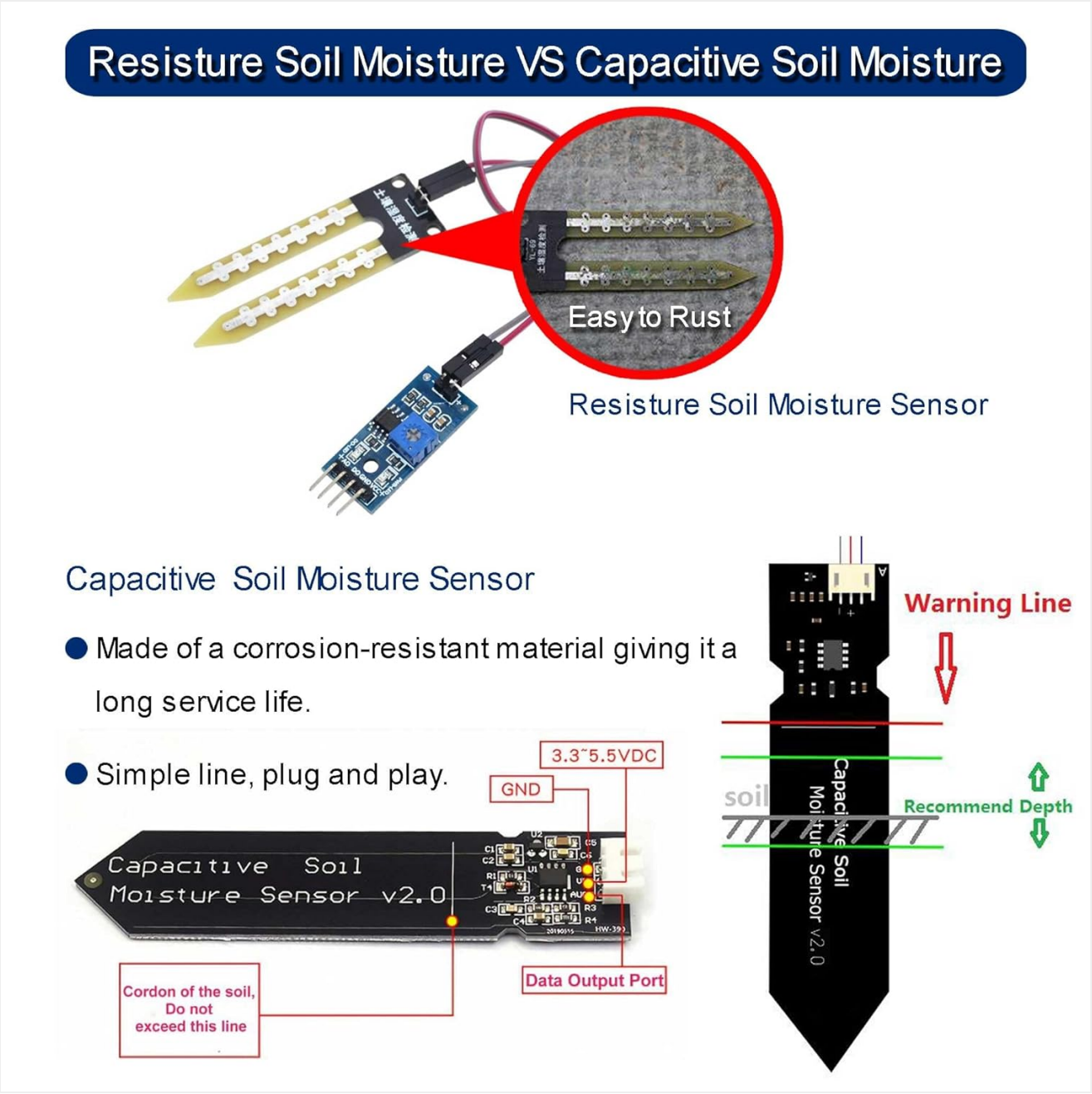

Image: Capacitive Soil Moisture Sensor. This image compares a resistive soil moisture sensor (prone to rust) with the included capacitive soil moisture sensor. The capacitive sensor is made of corrosion-resistant material for a longer service life. It shows the recommended depth for insertion and a warning line not to exceed. The sensor has a 3.3-5.5VDC input and a data output port.

- Insert the capacitive soil moisture sensor into the soil of your plant.
- Ensure the sensor is inserted up to the recommended depth, avoiding the "Warning Line" to prevent damage or inaccurate readings.
- Connect the sensor's 3-pin interface to your microcontroller as per the circuit diagram.

3. Mini Water Pump Setup

Proper installation of the water pump is crucial for its functionality and longevity.

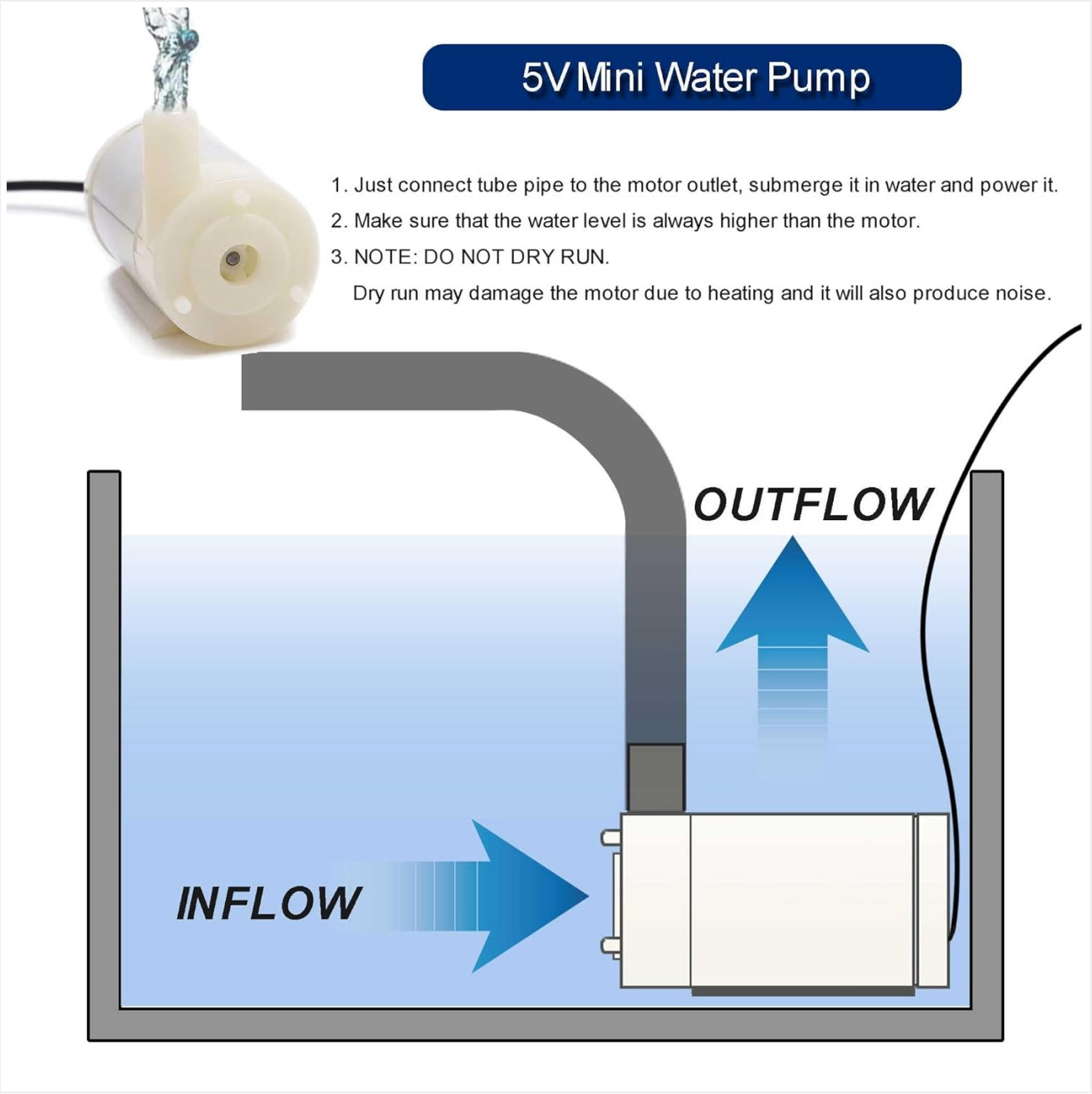

Image: 5V Mini Water Pump Setup. This diagram illustrates the correct setup for the 5V mini water pump. It shows the water tubing connected to the motor outlet, the pump submerged in water, and emphasizes that the water level must always be higher than the motor. A critical note warns against dry running the pump, as it can cause damage and noise.

1. Connect the provided water tubing to the motor outlet of the pump.
2. Submerge the pump completely in a water reservoir.
3. **Important:** Ensure the water level is always higher than the motor to prevent dry running. Dry running can damage the motor due to overheating and may produce noise.

4. DHT11 Sensor and OLED Display Integration

These components provide environmental data and visual feedback.

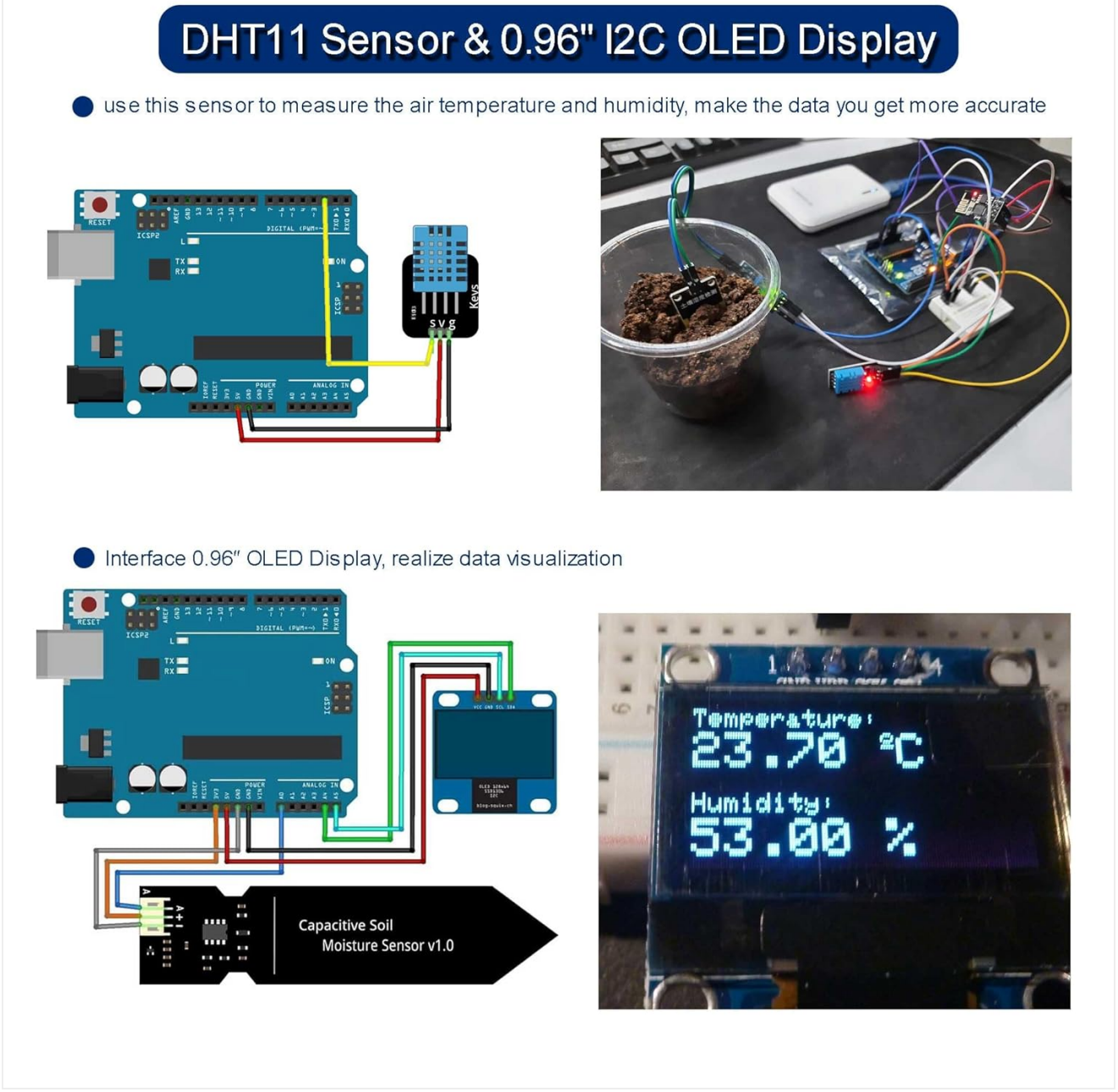

Image: DHT11 Sensor and 0.96" I2C OLED Display. This image shows the DHT11 sensor connected to a microcontroller to measure air temperature and humidity, providing more accurate data. It also illustrates the 0.96" OLED display interfaced with a microcontroller and a capacitive soil moisture sensor, enabling data visualization such as temperature and humidity readings.

- Connect the DHT11 sensor to your microcontroller to measure air temperature and humidity.
- Interface the 0.96" OLED Display with your microcontroller via I2C for data visualization.
- Ensure all connections follow the circuit diagram for proper functionality.

Operating Instructions

Once the system is fully assembled and programmed (programming instructions are typically provided with your microcontroller or found online for specific platforms like Arduino/ESP8266), the automatic irrigation system operates as follows:

1. The Capacitive Soil Moisture Sensor continuously monitors the moisture level in the soil.
2. The DHT11 Sensor provides ambient temperature and humidity data, which can be used for more advanced control logic if programmed.
3. When the soil moisture level drops below a pre-defined threshold (set in your microcontroller's code), the

microcontroller activates the 1 Channel 5V Relay Module.

4. The activated relay turns on the DC 3-6V Micro Submersible Mini Water Pump.
5. Water is pumped from the reservoir through the tubing to the plant until the soil moisture sensor detects that the desired moisture level has been reached.
6. Once the soil is adequately moist, the microcontroller deactivates the relay, turning off the water pump.
7. The 0.96" I2C OLED Display shows real-time data, such as soil moisture percentage, temperature, and humidity, allowing you to monitor the system's status.

Adjust the moisture threshold in your code to suit the specific needs of your plants.

Maintenance

Regular maintenance ensures the longevity and optimal performance of your automatic irrigation system.

- **Soil Moisture Sensor:** Periodically check the sensor for any buildup of dirt or mineral deposits. Gently clean with a soft, damp cloth if necessary. Ensure it remains inserted at the correct depth.
- **Water Pump:** Regularly inspect the water reservoir and pump for debris or blockages. Clean the pump and tubing as needed to maintain efficient water flow. Always ensure the pump is fully submerged when operating.
- **Water Reservoir:** Keep the water reservoir clean and free of algae or sediment. Refill as necessary.
- **Connections:** Periodically check all jumper wire connections on the breadboard and to the microcontroller to ensure they are secure.
- **Software:** If using a programmable microcontroller, ensure your code is up-to-date and optimized for your specific plant needs.

Troubleshooting

Problem	Possible Cause	Solution
Water pump does not turn on.	• Incorrect wiring to relay or pump. • Soil moisture above threshold. • Pump motor failure. • Insufficient power supply.	• Verify all connections according to the circuit diagram. • Check soil moisture reading on OLED; if high, pump will not activate. • Test pump directly with a 3-6V power source. • Ensure 5V power supply to relay and pump is adequate.
OLED display shows no data or incorrect data.	• Incorrect I2C wiring. • Incorrect display address in code. • Sensor not connected or faulty.	• Check SDA/SCL connections to NodeMCU. • Verify the I2C address of your OLED display in your code. • Ensure soil moisture and DHT11 sensors are correctly wired and functioning.
Soil moisture readings are inconsistent.	• Sensor not fully inserted or improperly placed. • Sensor dirty or damaged. • Interference from other components.	• Re-insert sensor to recommended depth, away from metal objects. • Clean sensor surface. Inspect for physical damage. • Ensure proper grounding and shielding if necessary.
DHT11 sensor shows incorrect temperature/humidity.	• Incorrect wiring. • Sensor faulty. • Environmental factors (e.g., direct sunlight).	• Verify DHT11 wiring to NodeMCU. • Replace sensor if suspected faulty. • Place sensor in a location representative of ambient conditions.

Specifications

Capacitive Soil Moisture Sensor

- Interface: 3-Pin Sensor interface (PH2.0-3P)
- Output: Analog
- Operating Voltage: DC 3.3-5.5V
- Output Voltage: DC 0-3.0V
- Size: 99x16mm / 3.9×0.63″

DHT11 Humidity Temperature Sensor

- Input Supply Voltage: 3.3 ~ 5V DC
- Supply Current: Measurement 0.3mA, Standby 60μA
- Temperature Measurement Range: 0~50 degrees Celsius
- Temperature Measurement Error: ±2 degrees Celsius
- Humidity Measurement Range: 20%~95%RH
- Humidity Measurement Error: ±5%RH

DC 3-6V Micro Submersible Mini Water Pump

- Operating Voltage: 2.5 ~ 6V
- Operating Current: 130 ~ 220mA

- Flow Rate: 80 ~ 120 L/H
- Maximum Lift: 40 ~ 110 mm
- Outlet Outside Diameter: 7.5 mm
- Outlet Inside Diameter: 5 mm

General Product Information

- Model Number: AL12692
- UPC: 687117714916
- Product Dimensions: 3.93 x 1.96 x 0.78 inches
- Item Weight: 0.64 ounces
- Hose Length: 1 Meter
- Power Source: DC
- Material: PVC

Warranty and Support

This product is typically covered by a standard return policy, allowing for refund or replacement within 30 days of purchase. For specific warranty details, please refer to your purchase documentation or the retailer's policy.
For further assistance, detailed tutorials, or if you encounter any issues not covered in this manual, please contact ALAMSCN customer service. Refer to the contact information provided with your purchase or on the official ALAMSCN store page.
Safety Precaution: Always refer to the included instructions and customer service for safety precautions and proper usage of electronic components.