Arduino Project: Component Connection Guide

This document outlines the clear connection path for an Arduino project involving a rain sensor, soil moisture sensor, relay (for pump control), and a servo motor for gate movement. It is based on the provided Arduino code.

# Component Connection Details

## 1. Rain Sensor

- Sensor Type: Digital rain sensor module (e.g., YL-83 or FC-37)

- Arduino Pin: Pin 2 (`RAIN\_SENSOR\_PIN`)

Connections:

* • VCC → 5V on Arduino
* • GND → GND on Arduino
* • DO (Digital Output) → Digital Pin 2

- Logic: Output is LOW when rain is detected.

## 2. Soil Moisture Sensor

- Sensor Type: Analog soil moisture sensor with probe

- Arduino Pin: A0 (`MOISTURE\_SENSOR\_PIN`)

Connections:

* • VCC → 5V on Arduino
* • GND → GND on Arduino
* • AO (Analog Output) → Analog Pin A0

- Note: Sensor readings range from 0 (wet) to 1023 (dry).

## 3. Relay Module (Pump Control)

- Function: Controls pump ON/OFF

- Arduino Pin: Pin 3 (`RELAY\_PIN`)

Connections:

* • VCC → 5V on Arduino
* • GND → GND on Arduino
* • IN (Control Input) → Digital Pin 3

- Logic:

* • LOW → Pump ON
* • HIGH → Pump OFF

- Caution: Use a relay module with an optocoupler for AC loads.

## 4. Servo Motor (Gate Control)

- Function: Opens/closes a gate based on rain detection

- Arduino Pin: Pin 9 (`SERVO\_PIN`)

Connections:

* • Signal (Orange/Yellow) → PWM Pin 9
* • VCC (Red) → 5V on Arduino
* • GND (Brown/Black) → GND on Arduino

- Power Note: Servo may require external 5V power if unstable. Always connect Arduino GND and external GND together.

# Arduino Pin Mapping Summary

|  |  |  |  |
| --- | --- | --- | --- |
| Component | Arduino Pin | Mode | Direction |
| Rain Sensor (Digital) | 2 | INPUT | From Sensor |
| Soil Moisture Sensor | A0 | INPUT | From Sensor |
| Relay (Pump Control) | 3 | OUTPUT | To Relay |
| Servo Motor | 9 | PWM | To Servo |

# Powering Considerations

- Avoid overloading Arduino 5V output.

- Use a separate 5V power supply for servo and relay if needed.

- Always connect GND of external power to Arduino GND.

# Optional Enhancements

* • Add a flyback diode across the pump if it's a DC motor.
* • Use capacitors near the servo to handle voltage dips.
* • Utilize Serial Monitor to view sensor readings for debugging.