**Smart Irrigation System using Robot:**

**Components Required:**

1. AURDINO UNO
2. L293D SHIELD
3. SERVO MOTOR SG90
4. DC PUMP
5. ULTRASONIC SENSOR
6. MOISTURE SENSOR
7. CHARGING MODULE (TP4056)
8. JUMPER WIRES
9. LI- ON BATTERY
10. BATTERY HOLDER
11. 100RPM GEARED MOTORS
12. MOUNTING
13. WHEELS
14. SCREWS
15. PLASTIC ROD
16. WATER CINTAINER

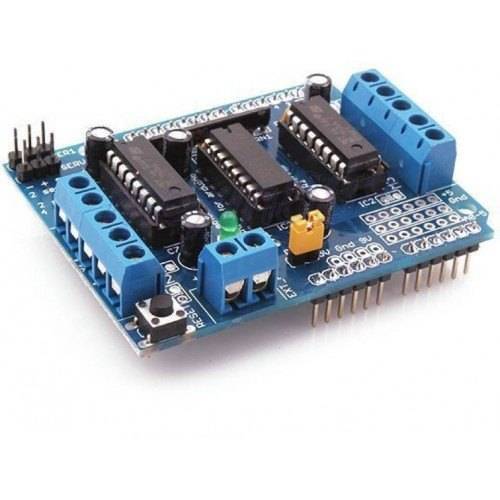
**Details Of Components:**

**AURDINO UNO**

Arduino UNO is a low-cost, flexible, and easy-to-use programmable open-source microcontroller board that can be integrated into a variety of electronic projects. This board can be interfaced with other Arduino boards, Arduino shields, Raspberry Pi boards and can control relays, LEDs, servos, and motors as an output.



**L293D SHIELD**

The servo motor is used to control the angular position of the pipe, which ensures equal distribution of water to the soil. L293D shield is a driver board based on L293 IC, which can drive 4 DC motors and 2 stepper or Servo motors at the same time. Each channel of this module has the maximum current of 1.2A and doesn't work if the voltage is more than 25v or less than 4.5v.

**SERVO MOTOR SG90**

SG90 is a popular micro servo motor commonly used in hobbyist and DIY projects. It is a small, low-cost servo motor that can rotate 180 degrees with a maximum torque of 1.8 kg-cm. It operates at 4.8-6V and has a weight of approximately 9 grams, making it ideal for small-scale robotics and model control applications. Tiny and lightweight with high output power. Servo can rotate approximately 180 degrees (90 in each direction), and works just like the standard kinds but smaller. You can use any servo code, hardware or library to control these servos. Good for beginners who want to make stuff move without building a motor controller with feedback & gear box, especially since it will fit in small places. It comes with a 3 horns (arms) and hardware.



**Ultrasonic Sensor**

It uses the ultrasonic sensor to measure the level of water in the reservoir and sends this to the microcontroller. Based on this the microcontroller decides which of the pumps to be deployed for irrigation at a particular time.



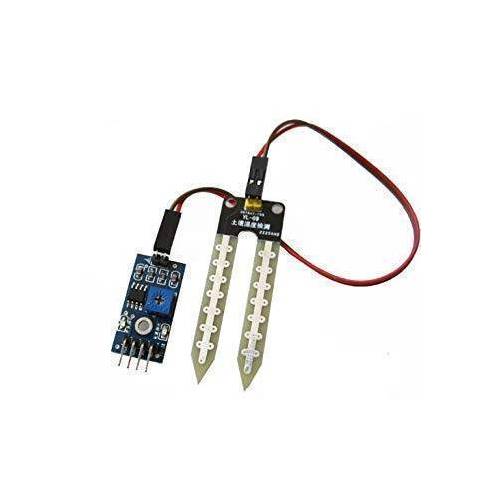
**DC PUMP**

A DC pump controlled by an Arduino microcontroller is a type of system that uses an Arduino to control the operation of a DC pump. The Arduino can be used to turn the pump on and off, as well as to control the flow rate and direction of the water.



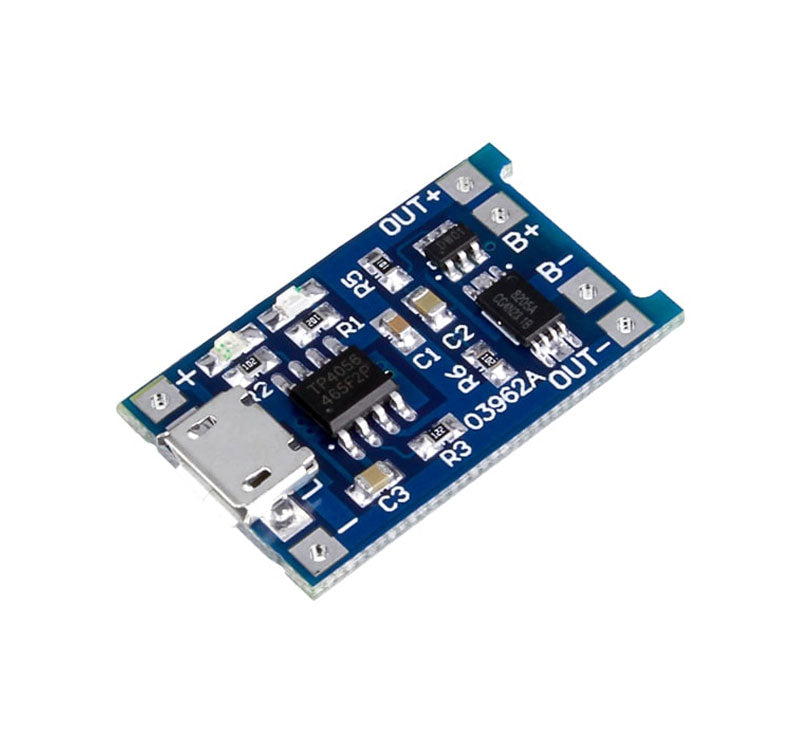
**MOSITURE SENSOR**

Measures” the soil moisture level, calculates how much water should be given and saves that value Soil moisture sensor is a novel device which senses the moisture content in the soil, and with suitable mechanism allows water to be irrigated depending on the moisture content of the soil.



**CHARGING MODULES TP4506**

TP4056 Battery Charging Module is one of the most used module for charging single cell Li-ion Batteries. It provides for different connections for battery and output. This module is made for charging rechargeable lithium batteries using the constant-current/constant-voltage (CC/CV) charging method. In addition to safely charging a lithium battery the module also provides necessary protection required by lithium batteries.



**RELAY**

The relay will control the flow of water from the pump based on actions given to Genuino 101. The water pump will be inside the water pump connected with a pipe. When the pump is turned on it will supply water from the pot through the connected pipe.



**BATTERY HOLDERS**

The primary function of a battery holder is to keep cells fixed in place safely and securely while conveying power from the batteries to the device in question.



**100RPM GEARED MOTORS**

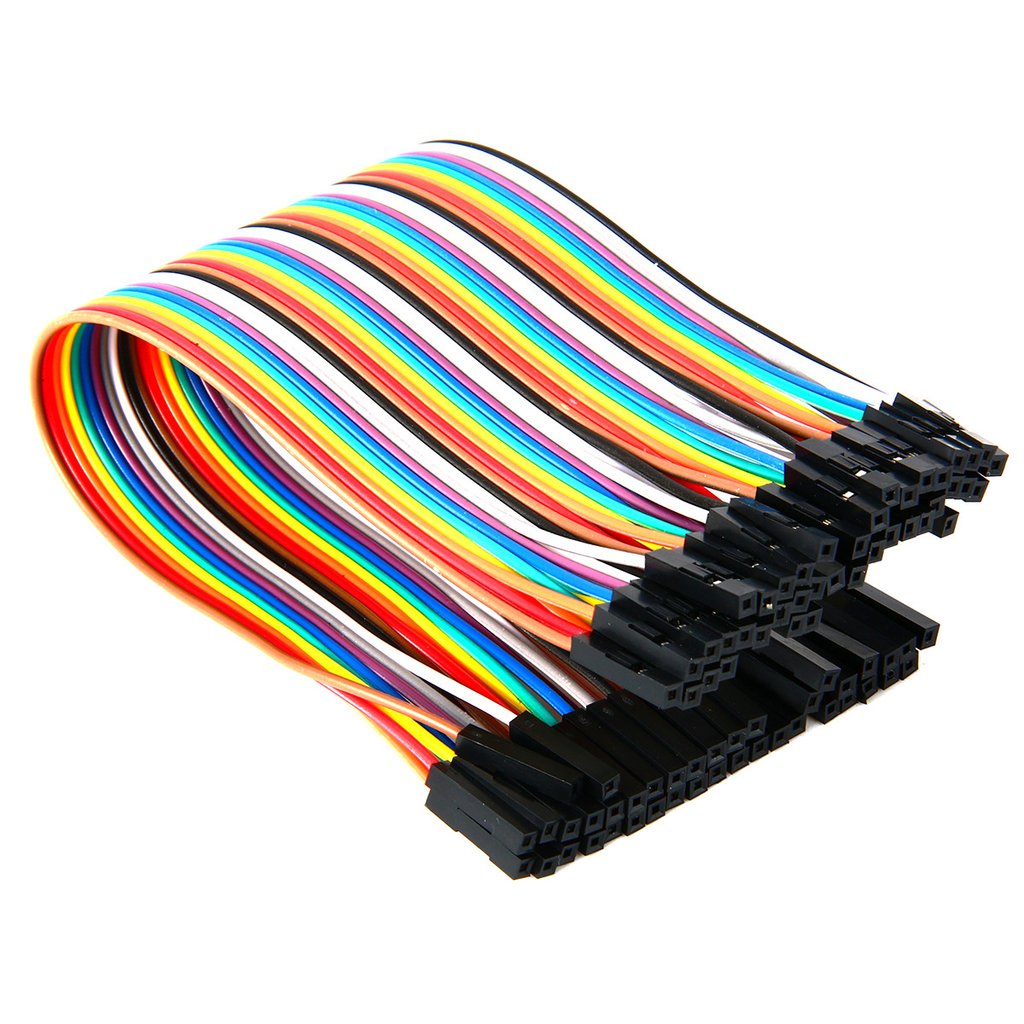
Electric Gear motors are used in applications that require high output torque and lower output shaft rotational speed, especially where space and available power are limited.

100 RPM can be used in all-terrain robots and a variety of robotic applications. These motors have a 3 mm threaded drill hole in the middle of the shaft thus making it simple to connect it to the wheels or any other mechanical assembly.



**JUMPER WIRES**

Jumper wires are used for making connections between items on your breadboard and your Arduino's header pins. Use them to wire up all your circuits.



**Li-On BATTERY**

A lithium-ion or Li-ion battery is a type of rechargeable battery which uses the reversible reduction of lithium ions to store energy.

