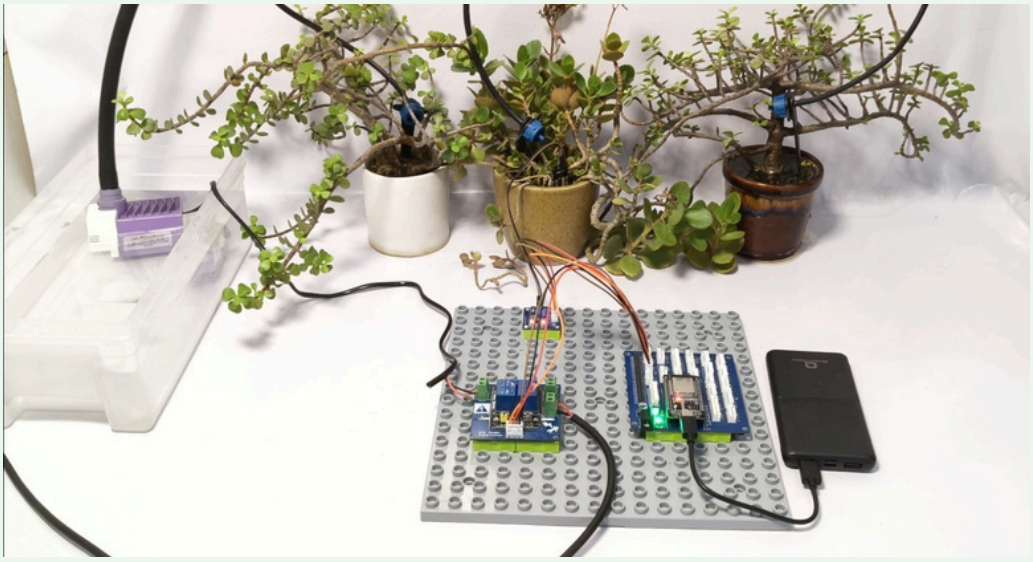
SAGEDEL
SKILL ADAPTIVE EDUCATION

DRIP IRRIGATION MODULE

Targeted watering at the roots for healthier plants and zero water waste.

2026



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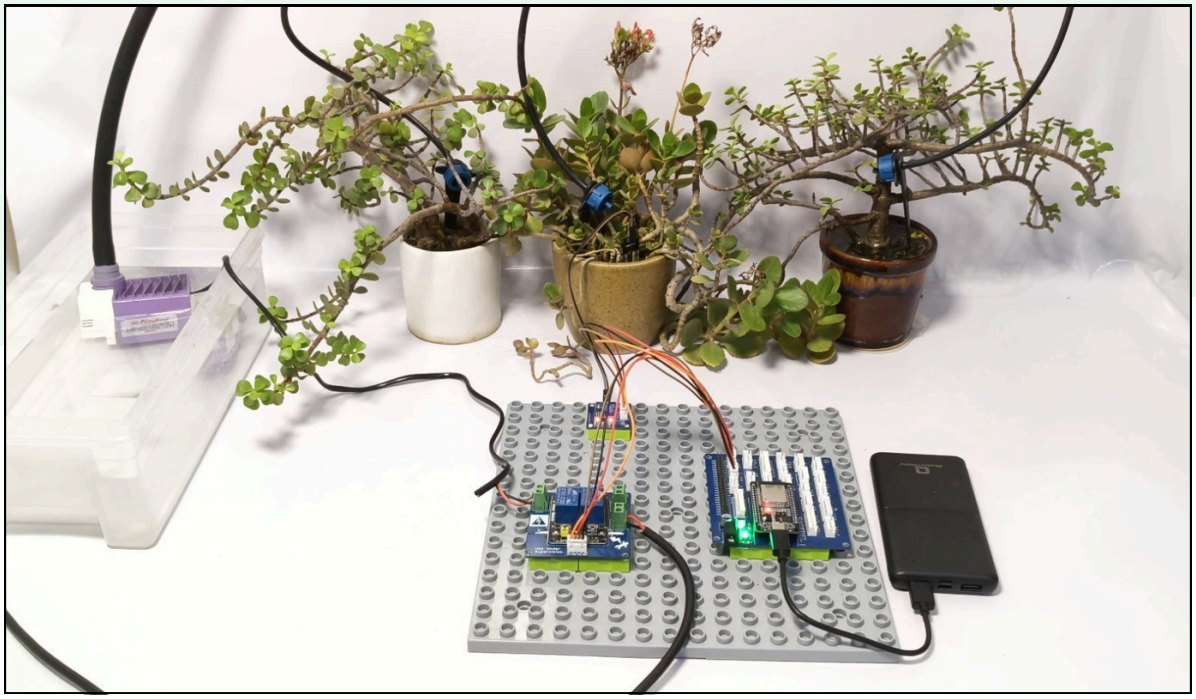
DRIP IRRIGATION SYSTEM

Objective:

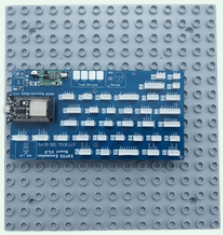
Learn how to interface a Soil Moisture Sensor and Water Pump Module with the ESP32 to automatically monitor soil moisture levels and provide water to plants when the soil becomes dry.

What it Does:

The ESP32 continuously reads data from the Soil Moisture Sensor to determine the moisture level of the soil. When the moisture drops below a predefined threshold, the ESP32 activates the Water Pump, supplying water through the drip irrigation system. Once the desired moisture level is reached, the pump automatically turns off, ensuring efficient water usage and healthy plant growth.

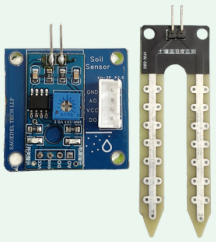


Modules & Components used:



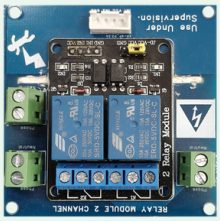
ESP32 Expansion Board V3.0

- Supports ESP32 development boards
- Easy GPIO access for quick connections
- Stable power distribution
- Ideal for IoT & embedded projects



Soil Moisture Sensor

- Detects soil moisture levels
- High sensitivity for accurate readings
- Easy interface with ESP32



Relay Module

- Controls the water pump automatically
- Provides safe electrical switching
- GPIO compatible with ESP32
- Reliable and easy to use

Power Code

- It is used to supply electrical power from a main outlet to control panels, pumps, or controllers in an automated drip irrigation system.

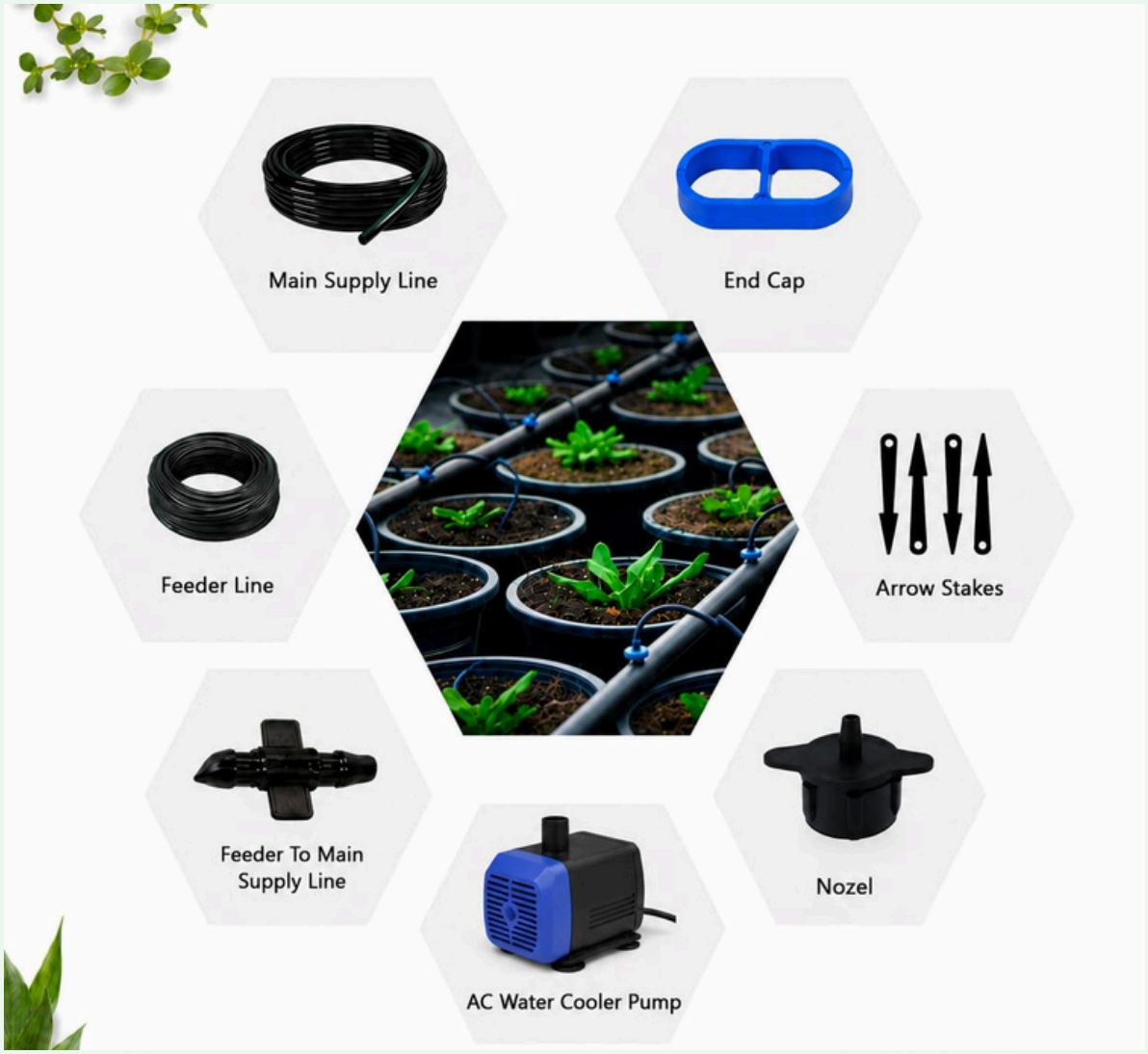
USB Cable

- It is used to supply power

JST Cable

- It is used to provide secure electrical connections

Drip Irrigation Accessories Kit

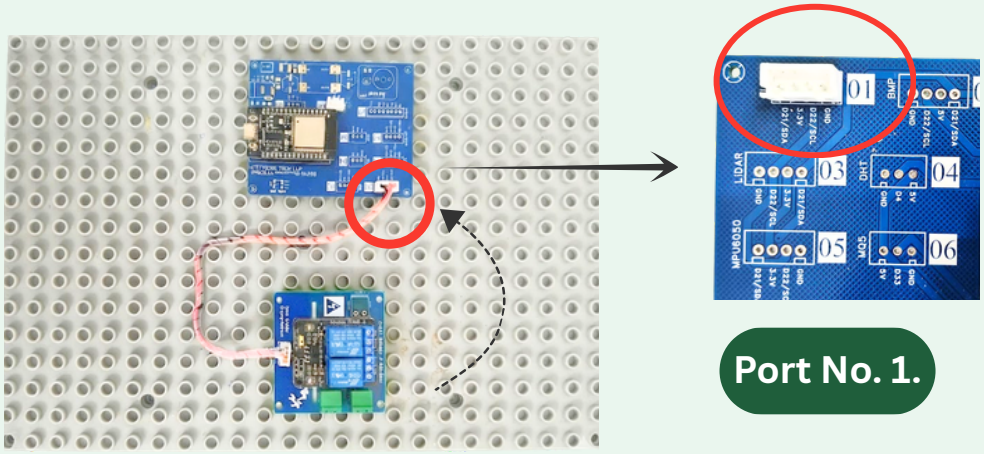


- Complete STEM kit for building an automatic drip irrigation system.
- Monitors soil moisture and waters plants only when required.
- Supports irrigation for up to 4–5 small plants using the included feeder pipe.
- Helps conserve water while promoting healthy plant growth.
- Ideal for IoT, automation, and smart agriculture learning projects.

Product images are for illustrative purposes only. Actual components may vary.

Connections:

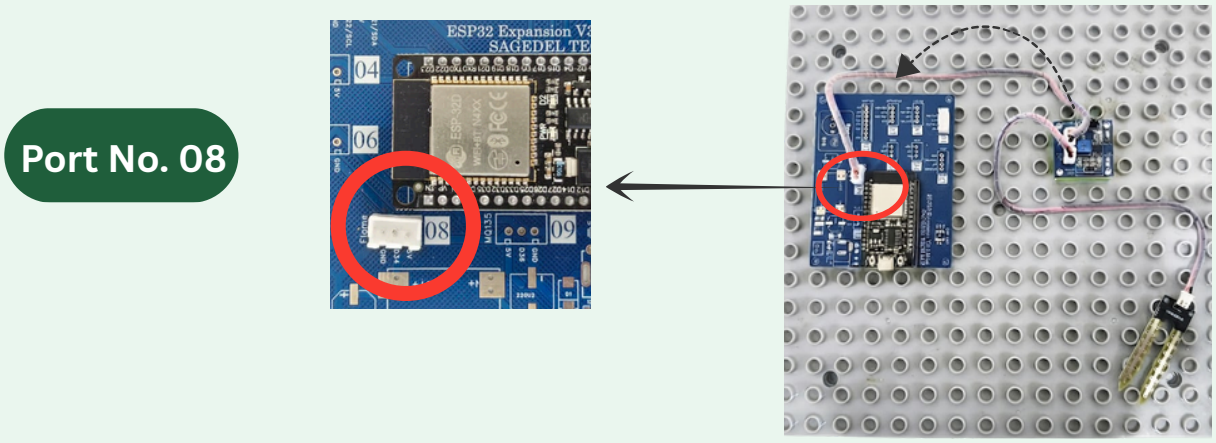
Step 1: Connect the **Relay Module**



Methods:

- Connect the Relay Module cable to Port No. 1.
- Ensure the connector is properly aligned and firmly attached.

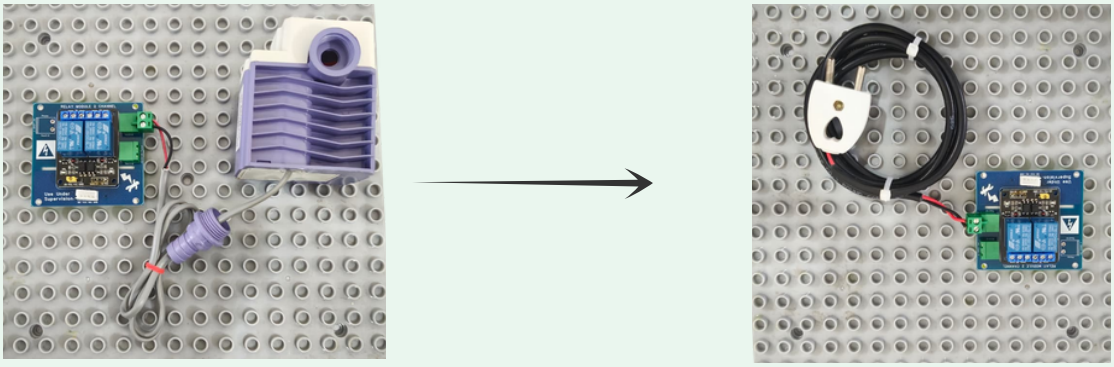
Step 2: Connect the **Soil Moisture Sensor**



Methods:

- Locate Port No. 8 on the ESP32 Expansion Board.
- Connect the Soil Moisture Sensor cable to Port No. 8.
- Insert the sensor probe into the soil near the plant roots.

Step 3: Connect the **Water Pump**



Methods-

- Connect the Power Cable to the Relay Module's AC Main Connector.
- Connect the Water Pump to the Relay Module's AC Load Connector.
- Attach the **Main Feeder Pipe** to the pump outlet and close the open end of the pipe using the End Cap.Place the Water Pump inside the water container and ensure all pipe and cable connections are secure

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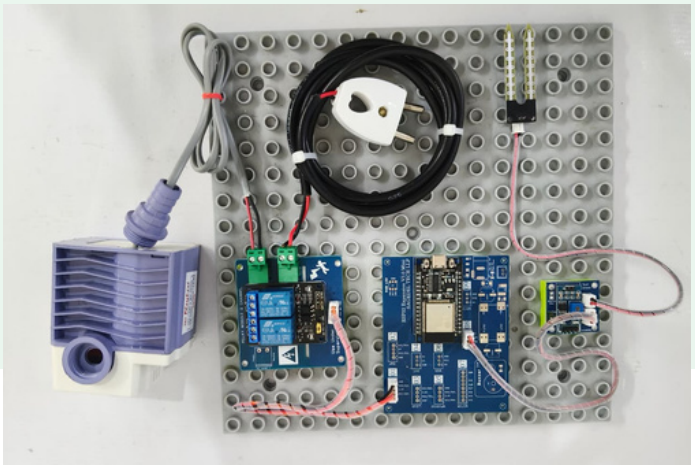
Step 4: **Power** On the System



Methods-

- Connect the ESP32 Expansion Board to a 5V USB power source using the provided USB cable.
- Switch on the power supply and wait for the system to initialize.
- The Soil Moisture Sensor will continuously monitor the soil moisture level.
- When the soil becomes dry, the Relay Module will automatically turn on the Water Pump. Once the required moisture level is reached, the pump will turn off automatically.