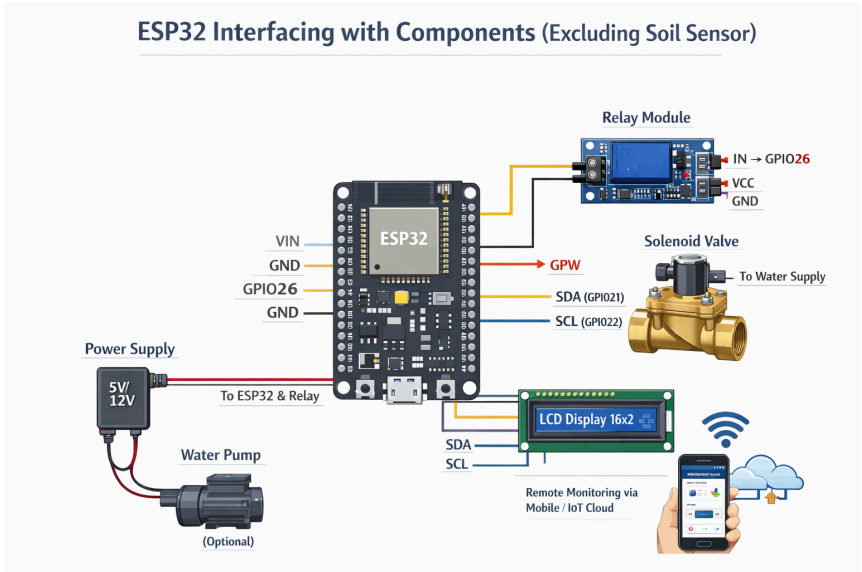Components List :

❖ Smart Irrigation Valve Control & Monitoring System

1. ESP32→ Main controller (brain of system)
2. Relay Module (5V)→ Used to switch solenoid valve ON/OFF
3. Solenoid Valve

   → Controls water flow automatically

4. Water Pump (Optional)

   → Used if water pressure is required

5. 5V / 12V Power Supply Adapter

   → Provides power to ESP32 and valve

6. LCD 16x2 Display (Optional)

   → Displays system status (Valve ON/OFF)

7. Jumper Wires (Male–Male, Male–Female)

   → For connections

8. Breadboard / PCB

   → Circuit assembly

9. Enclosure Box

   → Protects hardware setup

10. PVC Pipes & Fittings

   → For water connection

ESP 32 Interfacing :

ESP32 Interfacing with Components (Excluding Soil Sensor)

❖ **Important Pins:**

🧠 Controller: ESP32

Component	ESP32 Pin	Type	Type	Connection Purpose
Relay Module (IN)	GPIO26	Digital Output	Digital Output	• Control ON/OFF
Relay VCC	5V / VIN	Power	Power	• Supply to relay
Relay GND	GND	Ground	Ground	• Common ground
LCD SDA	GPIO21	I2C	I2C	• Data line
LCD SCL	GPIO22	I2C	I2C	• Clock line
LCD VCC	5V	Power	Power	• Supply
LCD GND	GND	Ground	Ground	• Common
Power Supply	VIN / 5V	Power	Power	• Input power
Power Supply	GND	Ground	Ground	• Common ground
	GND	GND	Ground	• Common ground