Automatic Gardening System

With NodeMCU and Blynk

Overview

If you travel a lot or are just generally bad with plants, this is the project for you. The goal of this project is to completely automate the process of gardening. We will capture the basic information, such as the temperature, humidity and moisture content from the plant and based on that data, the system will decide the when and how much water, light, etc. the plant requires and will automatically provide it. The project also allows manual operation through push buttons and wirelessly through the internet.

The project works by receiving data from the sensors like temperature and humidity of the air and soil. The buttons help control the pump and lamp locally. The system gives outputs after analysing the received data and though the relay powers the pump and lamp. An OLED is connected to the system so we can see display the data at any time.

Materials Required

- NodeMCU 1.0 (ESP-12E Module)
- OLED (SH1106 - SPI)
- Temperature and Humidity sensor (DHT11)
- Waterproof temperature sensor (DS18B20)
- Soil Moisture sensor
- 5V Relay
- Mini Water Pump
- Lamp (Optional)
- Push buttons (x2)
- LEDs
- Resistors (10k Ohms x2, 2.2M Ohms x2)
- Breadboard
- Jumper wires
- Etc

Software Required

- Arduino IDE
- Blynk App (for mobile)
- Libraries:

➔ Wire.h // included in Arduino IDE
➔ SPI.h // included in Arduino IDE
➔ esp8266-oled-sh1106
➔ Blynk
➔ BlynkESP8266_Lib
➔ SimpleTimer
➔ OneWire
➔ DallasTemperature
➔ DHT

Pin Connections

For OLED

- D5 GPIO14 CLK → D0 pin OLED display
- D6 GPIO12 MISO (DIN) → not connected
- D7 GPIO13 MOSI (DOUT) → D1 pin OLED display
- TX GPIO1 RST → RST pin OLED display
- RX GPIO3 DC → DC pin OLED
- D8 GPIO15 CS / SS → CS pin OLED display

For DS18B20

- Vcc → 5V (Red)
- Data → D2 (Yellow)
- GND → GND (Black)
- Vcc → 10k Ohms → Data // Important

For DHT11

- Vcc (1) → 5V
- Data (2) → D3
- (3) → Not connected
- GND (4) → GND

For Moisture sensor

- Vcc → D4 // because connecting it directly to 5V spoils and reduces the life of the sensor
- GND → GND
- D0 → Not connected
- A0 → A0

Logic Level Converter

// These connections may not work for you. Use hit and trial error to determine what combination works for you

- A Vcc → 3.3V
- A SDA → GPIO10
- A GND → GND
- B Vcc → 5V
- B SDA → Relay IN
- B GND → GND

Relay

- Vcc → Vcc
- GND → GND
- IN → B SDA

Others

- Pump Input → D1
- Pump Button → GPIO10
- Lamp Button → D0