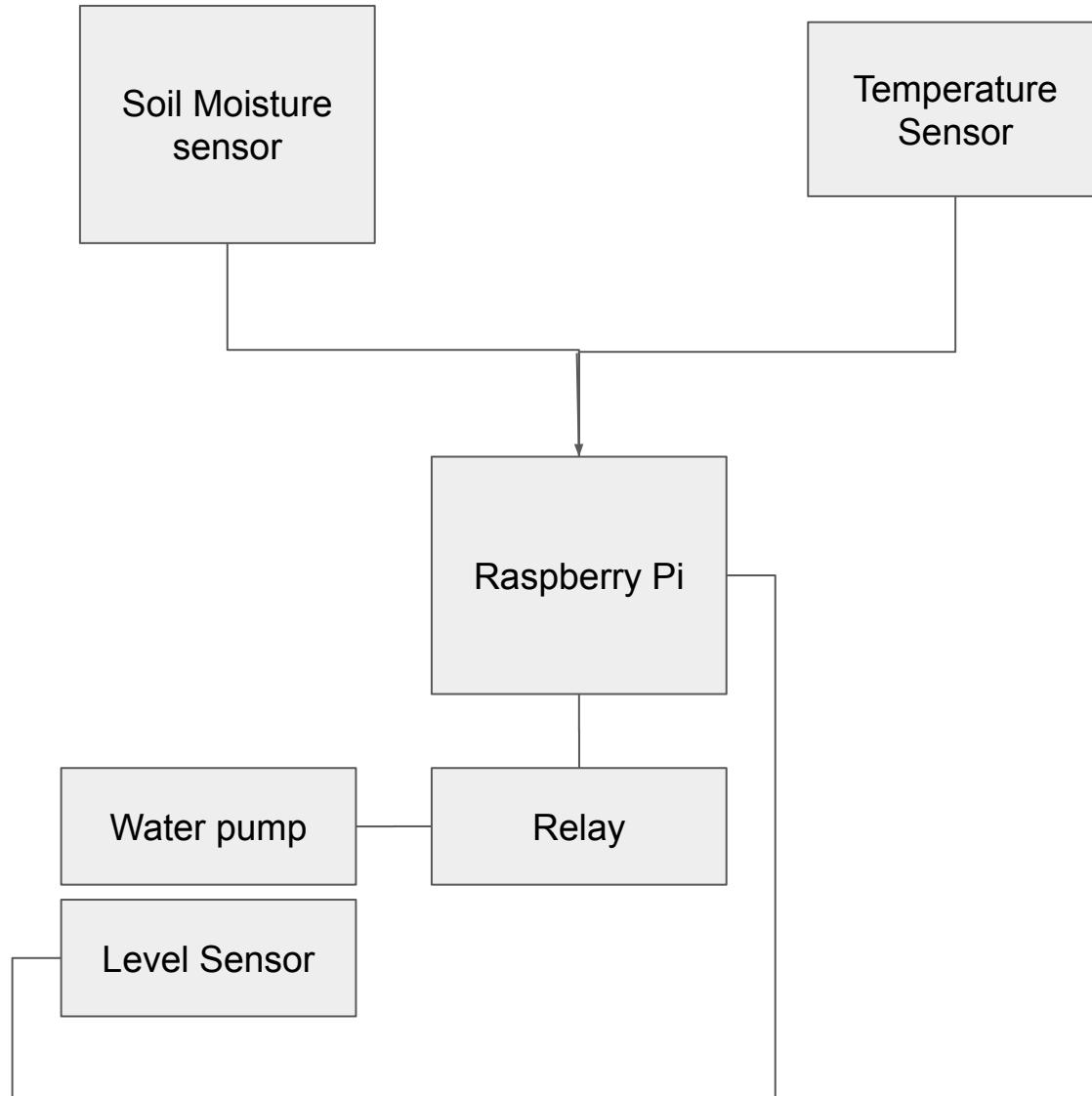


IoT based farm monitoring

Block Diagram



Hardware

- NodeMCU
- Relay
- DC pump
- Temperature and humidity sensor

NodeMCU

About:

The Development Kit based on ESP8266, integrates GPIO, PWM and ADC all in one board.

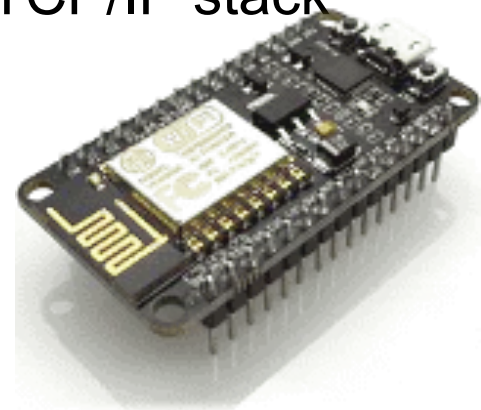
It is open-source firmware and development kit that helps you to prototype your IOT product

It can be programmed using little effort, and the Arduino IDE.

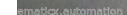
There is lots of support for the ESP and the Arduino.

The ESP8266 low-cost Wi-Fi chip with full TCP/IP stack

Links



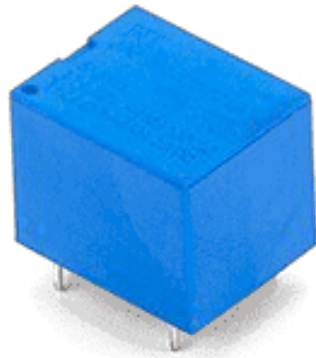
configurable from 1200-115200 through AT command.



Relay

The Single Pole Double Throw SPDT relay is quite useful in certain applications because of its internal configuration.

It has one common terminal and 2 contacts in 2 different configurations: one can be Normally Closed and the other one is opened or it can be Normally Open and the other one closed.



DC Pump

Operating : 3v to 6v DC

Power consumption: 0.4W to 1.5W

Rate of flow: 80 - 120L/hr

Lift : 1.1m MAX.

Type :submersible

Dimension: 45 x 24 x 30 (LxHxB)MM



DHT 11

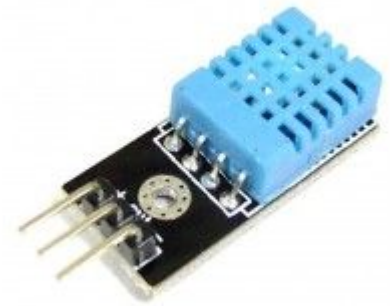
Power Supply: 3.3~5.5V DC

Output: 4 pin single row

Measurement Range: Humidity 20-90%RH,
Temperature 0~50°C

Accuracy: Humidity $\pm 5\%$ RH, Temperature $\pm 2^{\circ}\text{C}$

Resolution: Humidity 1%RH, Temperature 1°C

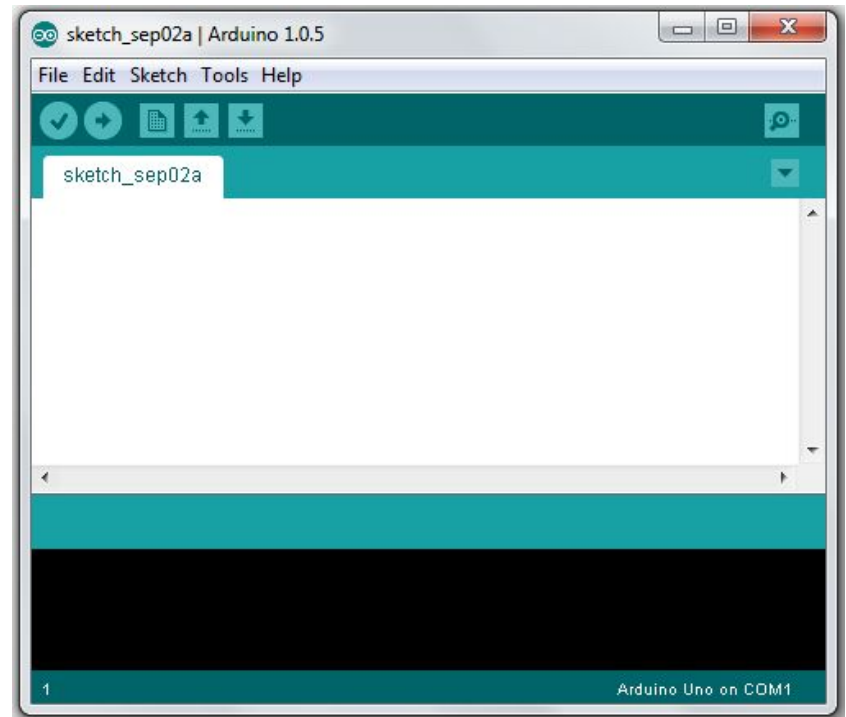


Software

- Embedded C – Backend programming for sensor and Ethernet data interfacing
- Compiler : Arduino IDE

• Arduino Compiler

- **Arduino Compiler**
- **Language: Embedded C for Arduino**



-

- The Arduino programming language is a simplified version of C/C++. If you know C, programming the Arduino will be familiar.
- If you do not know C, no need to worry as only a few commands are needed to perform useful functions.

-

Working

- Laptop is connected to system via LAN/ Internet
- Arduino took the data from temp & Soil sensor and send to webserver
- When the soil is dry the pump will on
- It shows the temperature on cloud server
- GSM used to send sms if the water in the well is not available and the pump start signal is ON

Progress till date

- Study about Arduino interfacing with Soil sensor and Relay

Next Task

- NodeMCU and interfacing with Soil sensor, DHT sensor, Relay
- Getting NodeMCU Online with IP address
- Creating web server with MySql database and table files for Time/Date, Soil status, Temperature and Humidity
- Programming NodeMCU to send data to cloud server
- Programming PHP to see the data online

References

- [1].“current status of e-agriculture and global trends:”a survey conducted in transnzoia county, kenya”, international journal of science & research,. july 2013.
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- [3]. ahmed a.1, olaniyi, o.m.2, folorunsho, t. a.3 and okogbe,4,“development of a gsm based health monitoring system for elderly people”,journal of advancement in engineering and technology, august 8, 2015,