

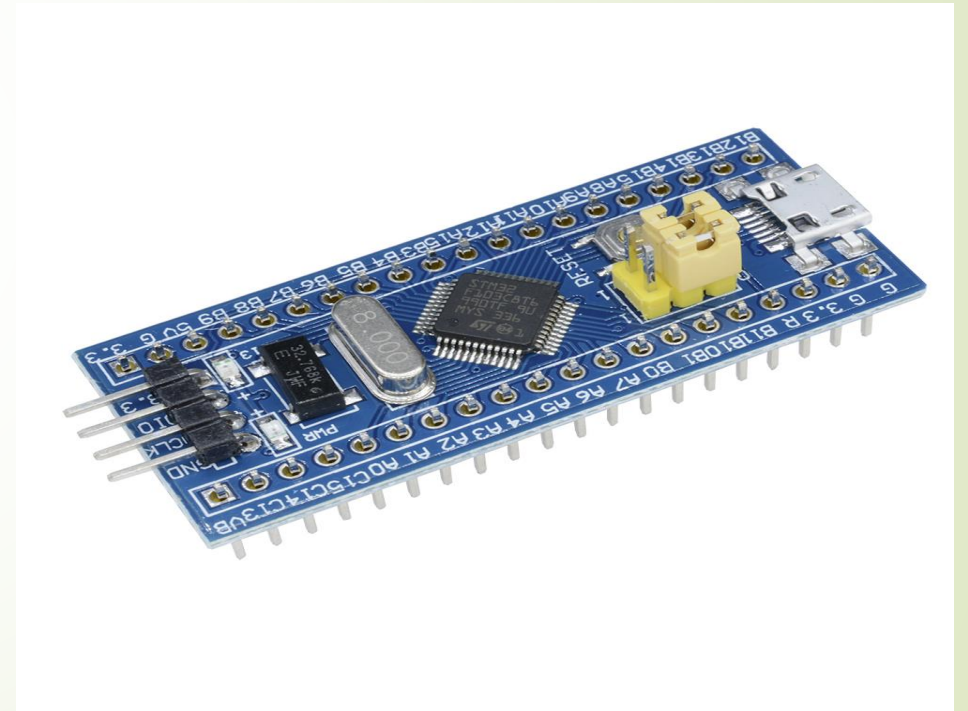
Device to measure NPK, temperature and humidity of soil



**Presented by:
AAHPS**

STM32F103C8T6 microcontroller

STM32F103C8T6 Blue Pill Development Board contains a 32-bit Cortex-M3 RISC ARM core with an internal oscillator of 4 -16 MHz . It is a CMOS flash technology chip. This chip has 37 GPIO pins and 10 Analog pins.



DS18B20 water proof temperature sensor

The **DS18B20** is a 1-wire programmable Temperature sensor from maxim integrated. It can measure a wide range of temperature from **-55°C to +125°** with a decent accuracy of **±5°C**. Its specification are:

- Programmable Digital Temperature Sensor
- Communicates using 1-Wire method
- Operating voltage: 3V to 5V
- Temperature Range: -55°C to +125°C
- Accuracy: ±0.5°C
- Output Resolution: 9-bit to 12-bit (programmable)
- Unique 64-bit address enables multiplexing
- Conversion time: 750ms at 12-bit
- Programmable alarm options
- Available as To-92, SOP and even as a waterproof sensor



NPK sensor

The soil NPK sensor is suitable for detecting the content of nitrogen, phosphorus, and potassium in the soil. It helps in determining the fertility of the soil thereby facilitating the systematic assessment of the soil condition.



Capacitive soil moisture sensor

A capacitive moisture sensor works by measuring capacitance changes caused by the changes in the dielectric. It does not measure soil moisture directly (as pure water does not conduct electricity well), instead it measures the ions that are dissolved in the moisture.



RS485 Modbus Module

RS-485 uses differential signaling to transfer binary data from one device to another. Differential signaling works by creating differential voltage using 5V positive and negative. This differential signaling method has the advantage in rejecting common mode noise. RS-485 supports a maximum data transfer rate of 30 Mbps.



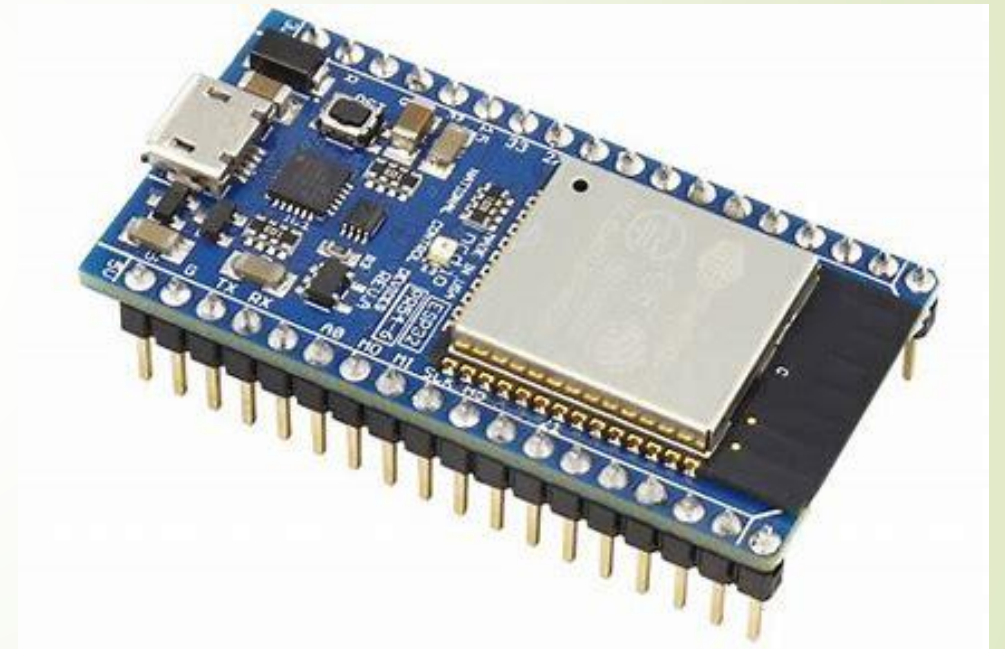
NRF 24L01 Wireless Transceiver

It is use to transmit data. It uses the 2.4 GHz band and it can operate with baud rates from 250 kbps up to 2 Mbps. If used in open space and with lower baud rate its range can reach up to 100 meters.



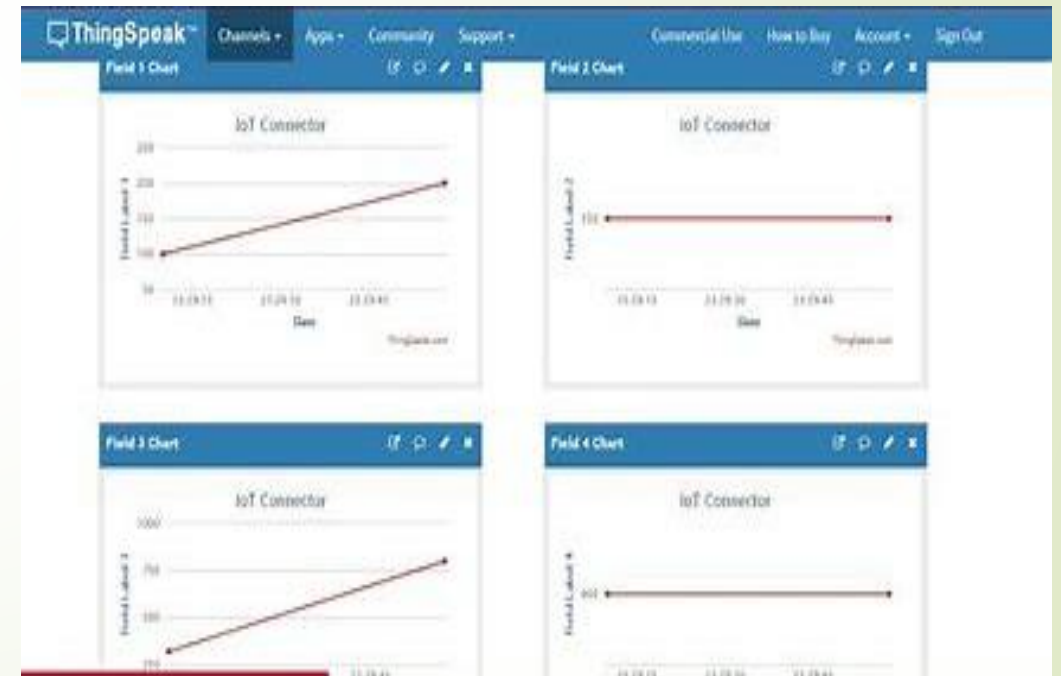
ESP 32 wi-fi module

The ESP32 connects to an available WiFi field which in turn is connected to your internet. This is exactly similar to connecting your mobile phone to an available WiFi network. Access Point Mode - This is equivalent to turning on the hotspot on your mobile phone so that other devices can connect to it. Similarly, ESP32 creates a WiFi field around itself that other devices can connect to. ESP32.



Thingspeak

ThingSpeak is an IoT analytics platform service that allows you to aggregate, visualize, and analyze live data streams in the cloud. You can send data to ThingSpeak from your devices, create instant visualization of live data, and send alerts.





Thank you