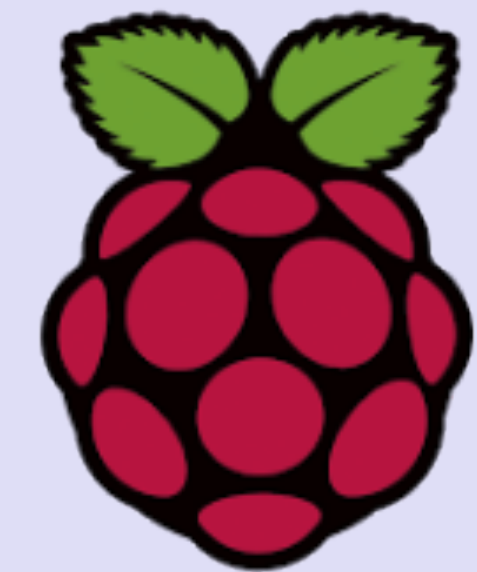
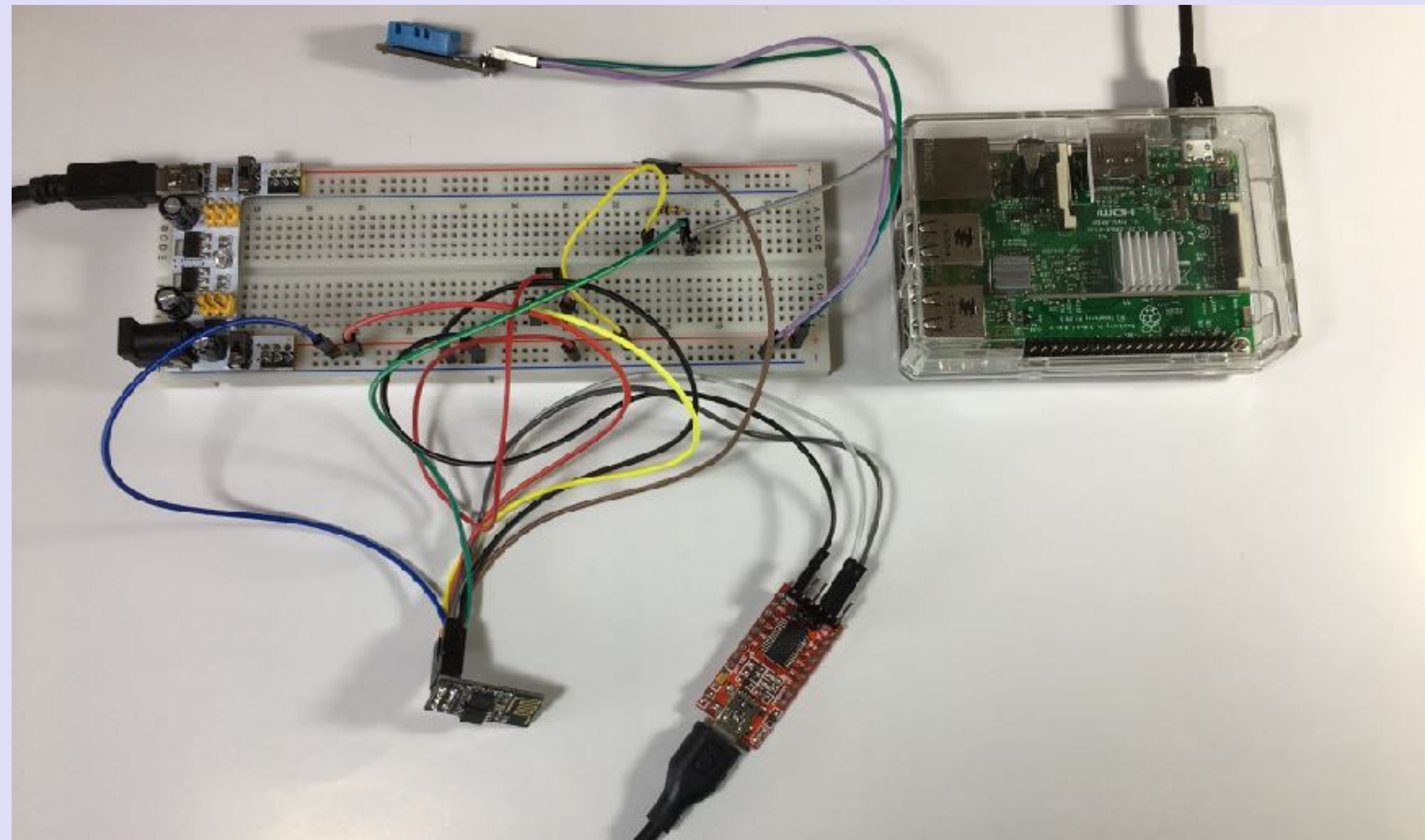
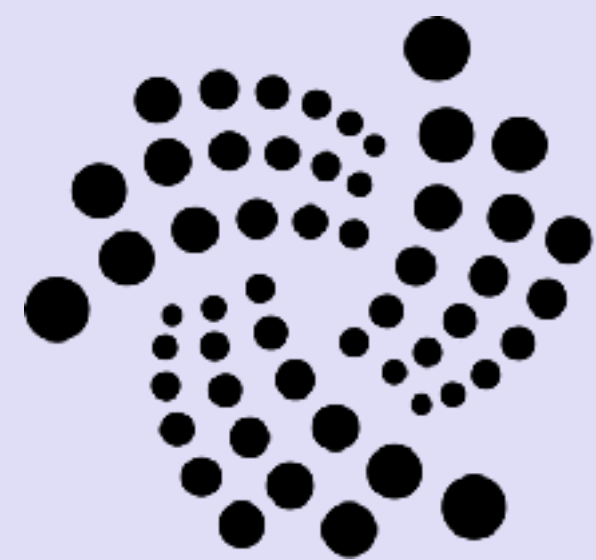


IOTA TUTORIAL 30

Send DHT11 data to the tangle using ESP-01S, MQTT and MAM



INTRO

- In this tutorial I will demonstrate how to send DHT11 sensor data from an ESP-01S WiFi module to the tangle using MQTT and Masked Authenticated Messaging.

SEND SENSOR DATA TO TANGLE USING MQTT AND MAM

- A complete step-by-step guide how to send DHT11 sensor data from an ESP-01S WiFi module to the tangle using MQTT and Masked Authenticated Messaging can be found at:

https://www.mobilefish.com/developer/iota/iota_quickguide_esp01s_mam.html

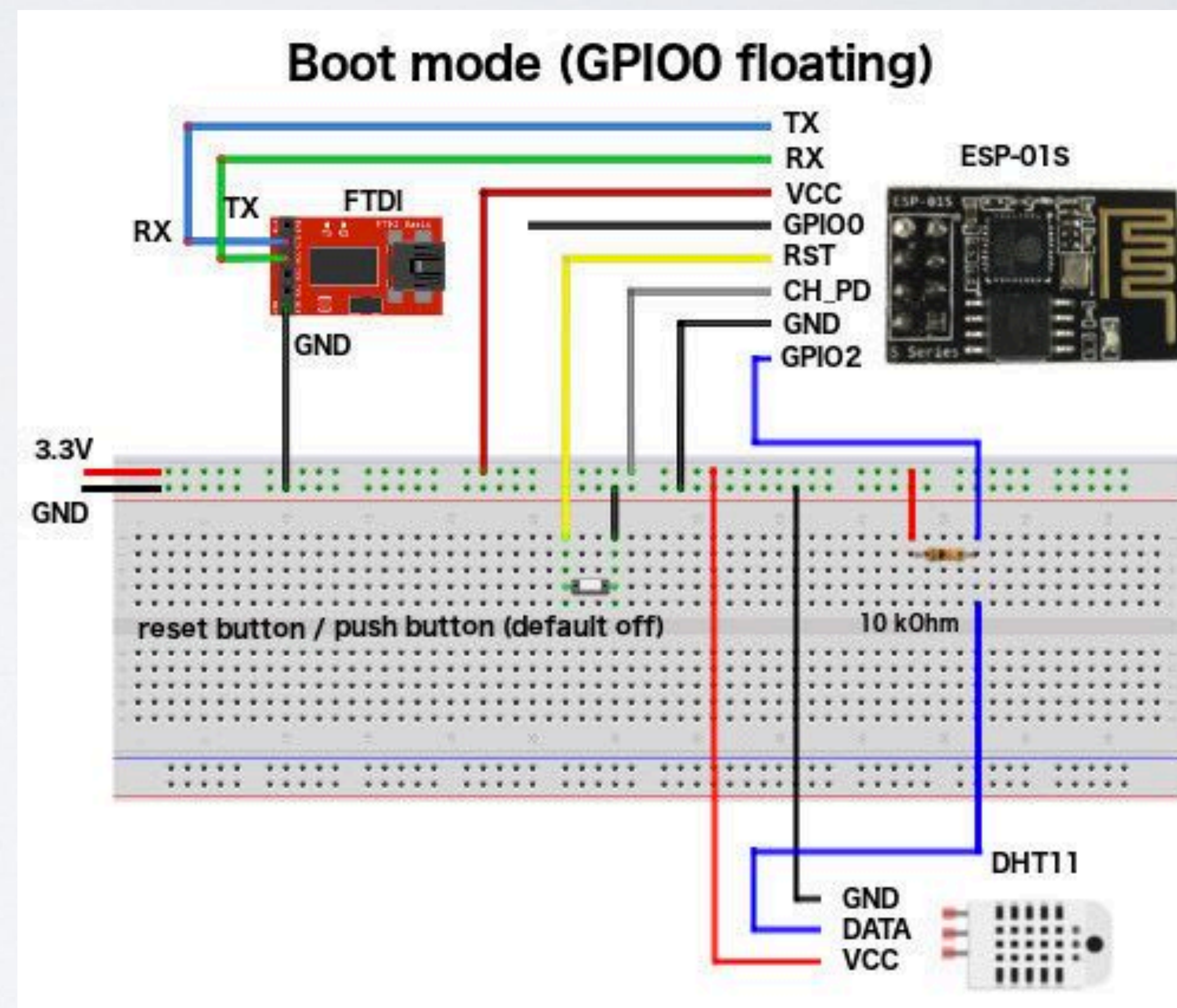
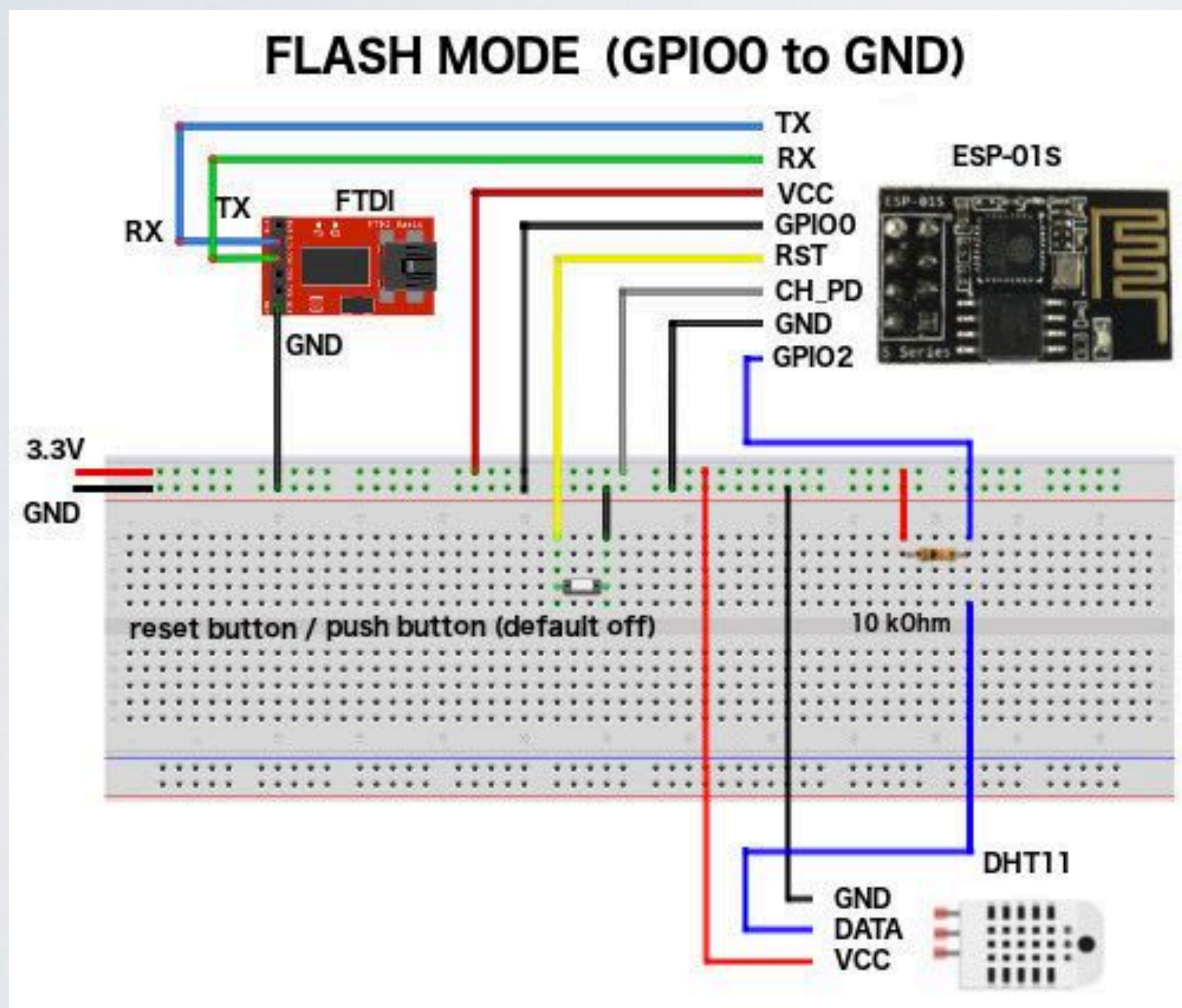
- The source code used in the guide can be found at:

<https://github.com/robertlie/dht11-esp01s>

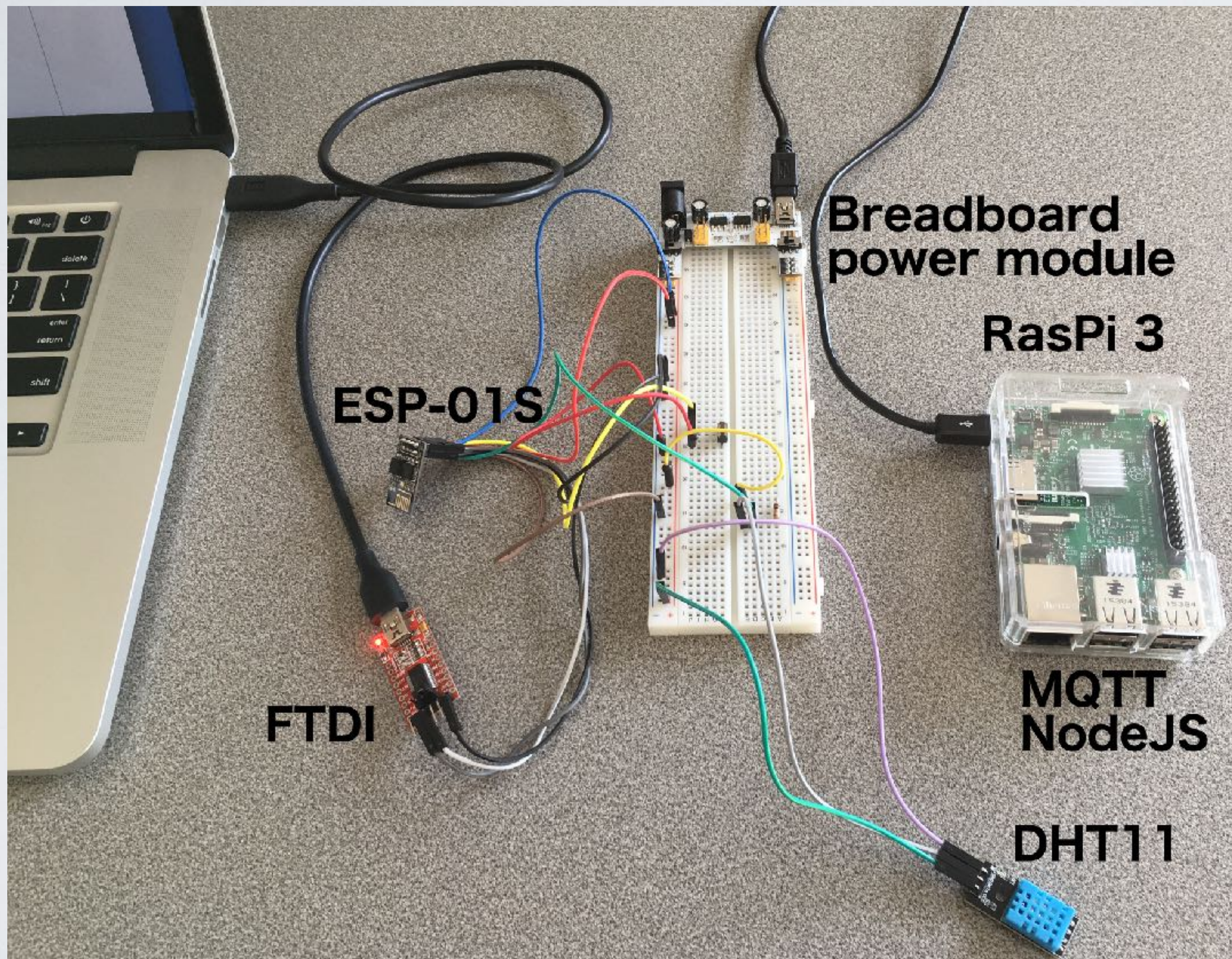
FTDI, ESP-01S AND DHT11 WIRING DIAGRAM

Flash mode: Upload Arduino sketch / firmware

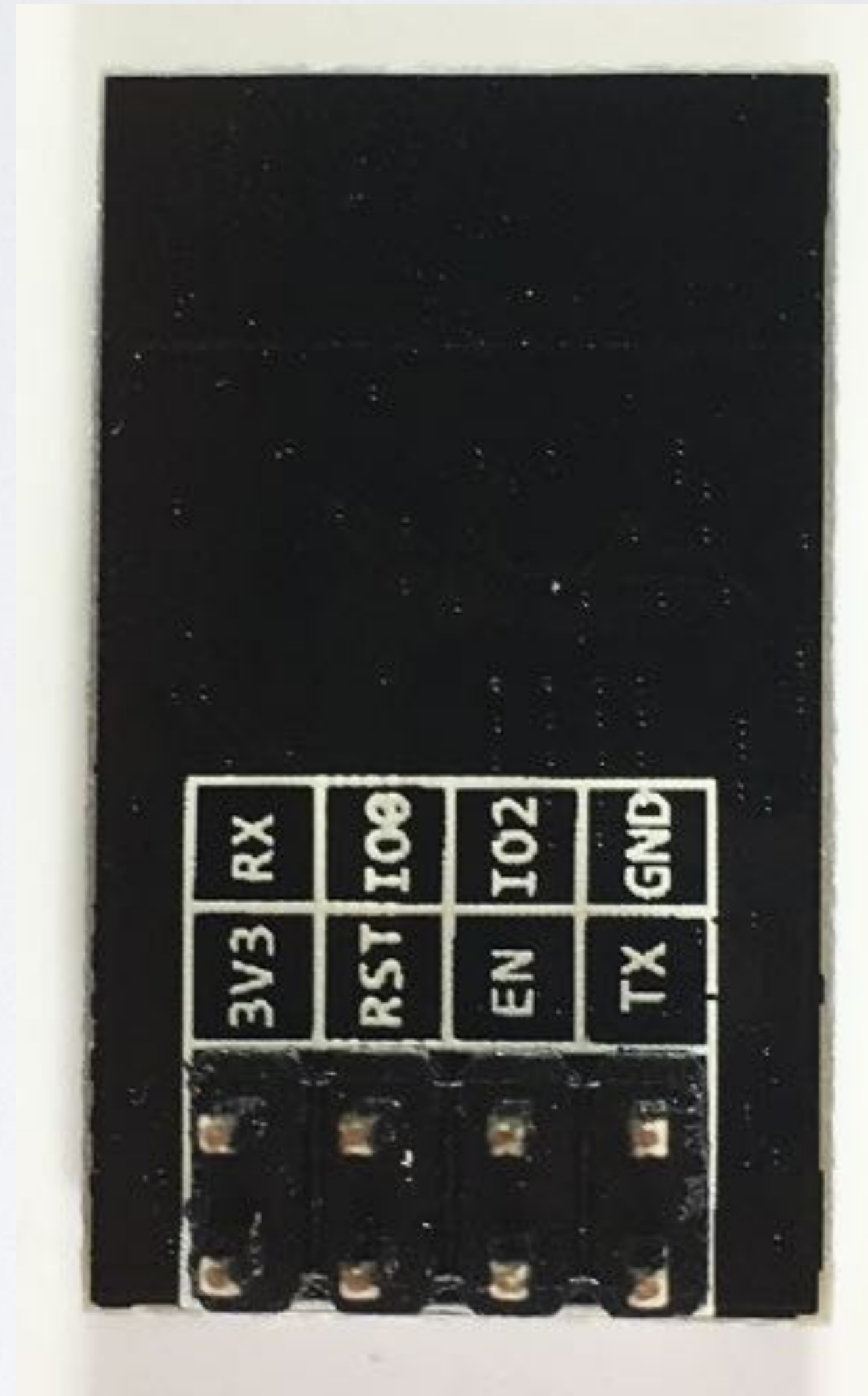
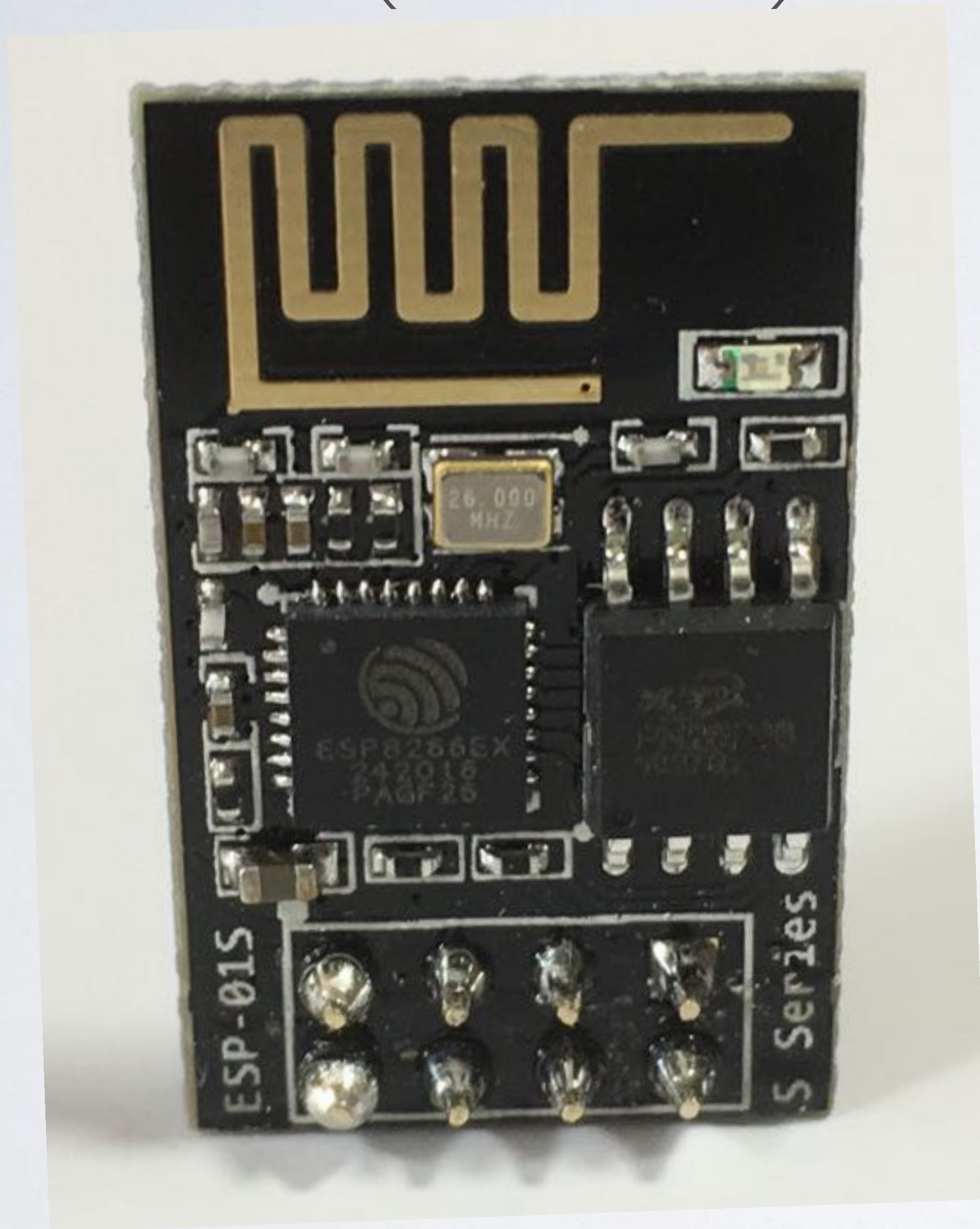
Boot mode : Execute sketch / firmware



TEST SETUP

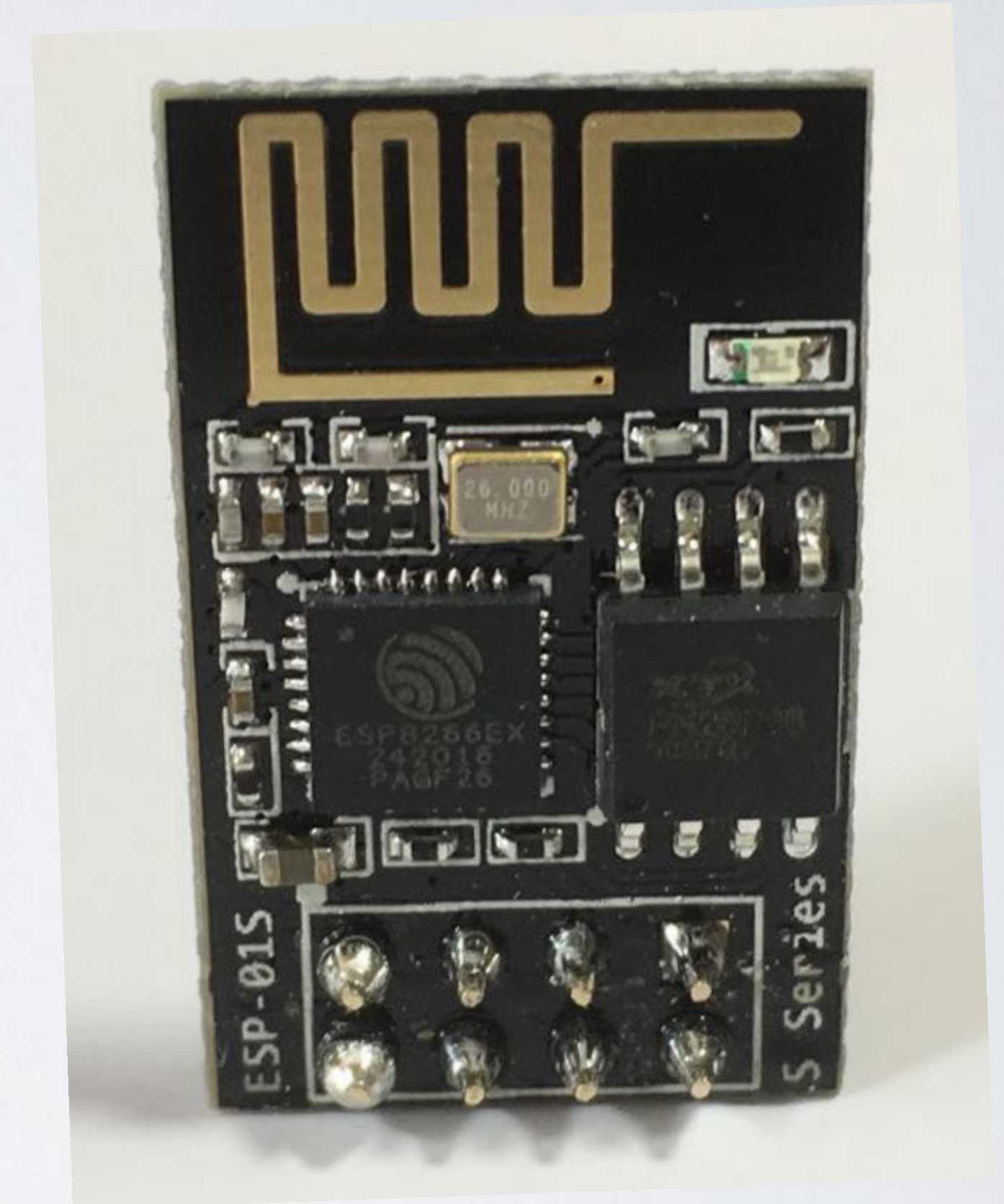


ESP-01S (ESP8266) WIFI MODULE



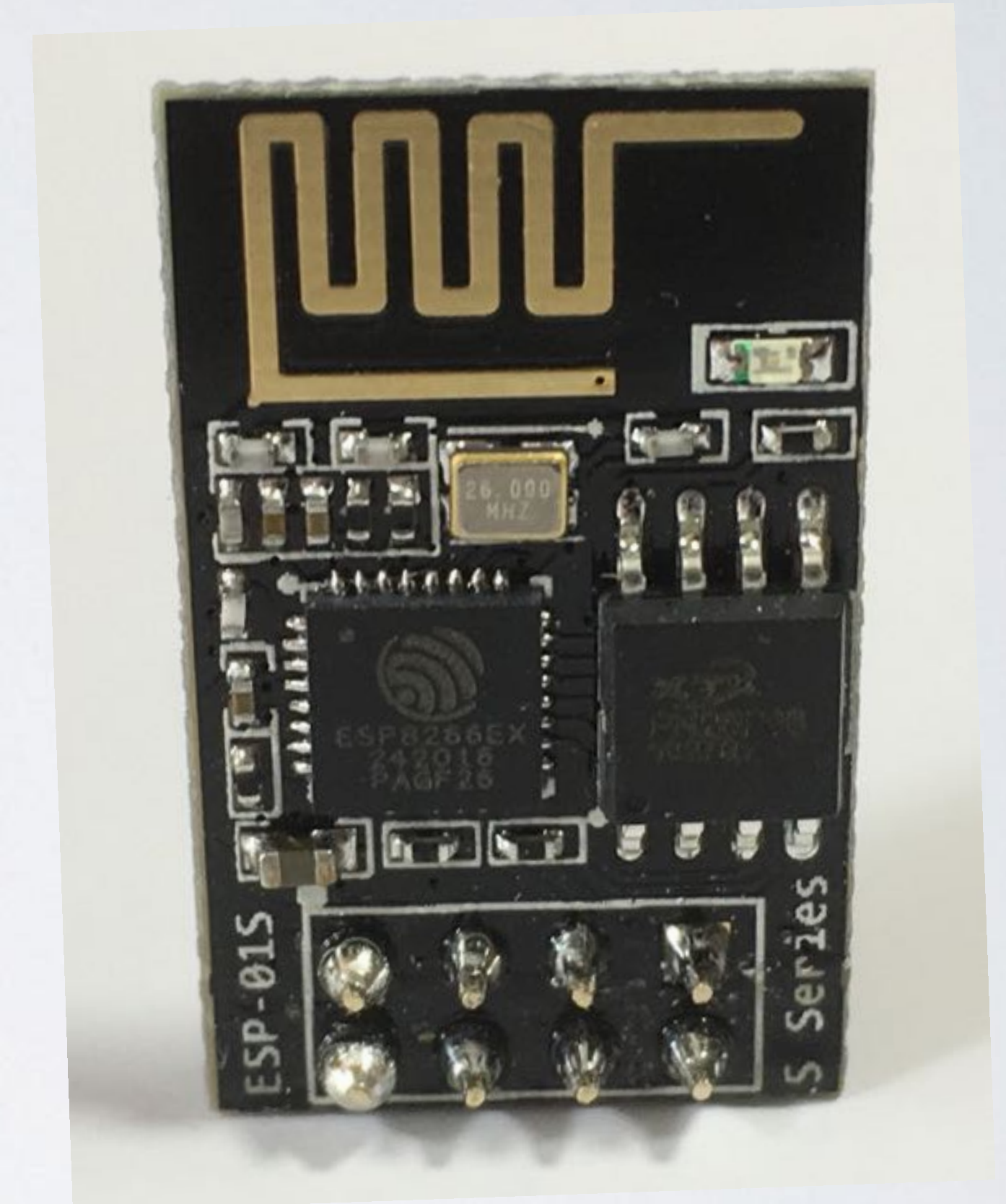
ESP-01S (ESP8266) WIFI MODULE

- Flash memory: 1 MByte
- Max transmission distance: ~400 m (direct line of sight)
- Package size: 24.7mm x 14.4mm
- WiFi protocols: 802.11 b/g/n
- Supply voltage: 3.0 to 3.6V
- Operating current (average value): 80 mA
- Comes pre-programmed with an AT command set firmware.

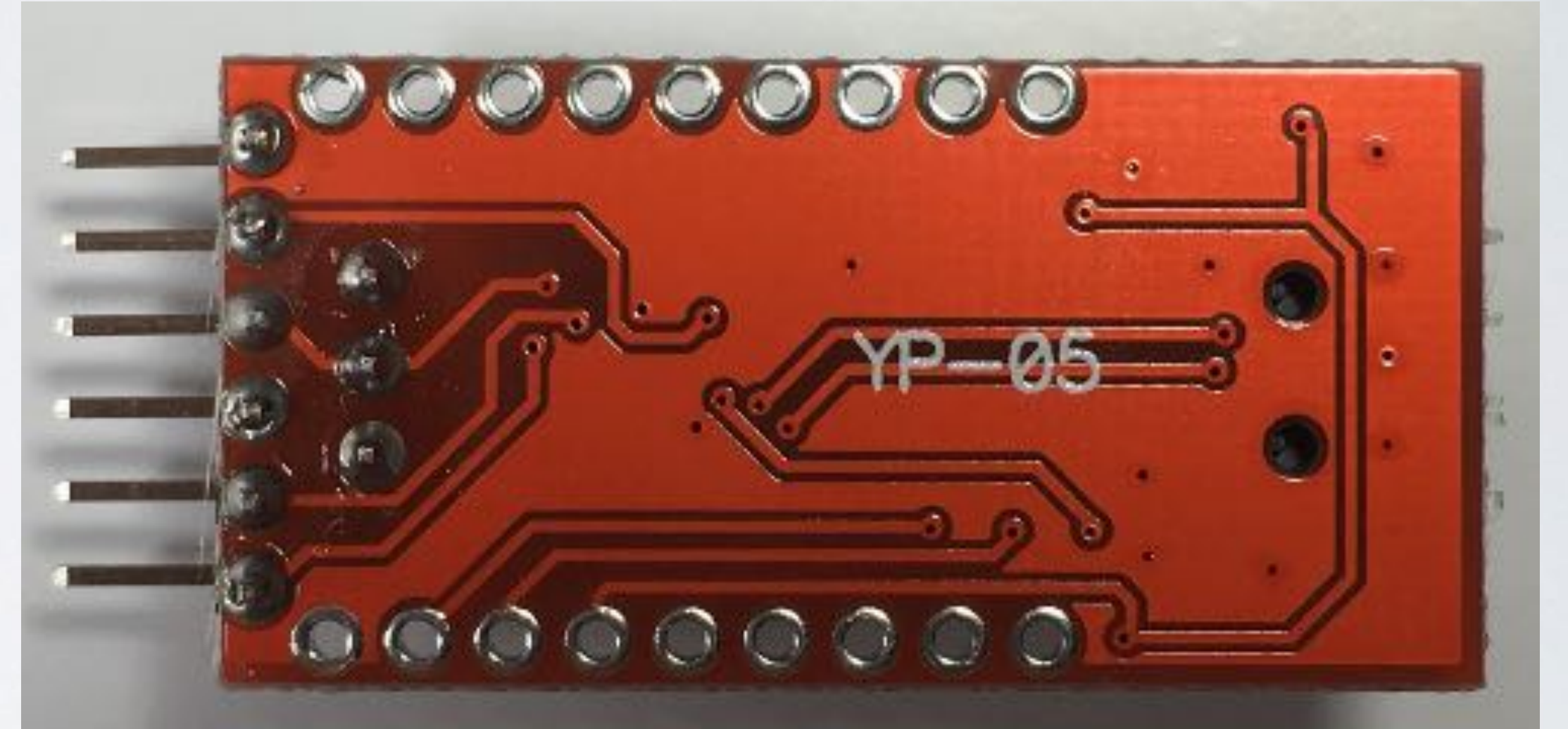
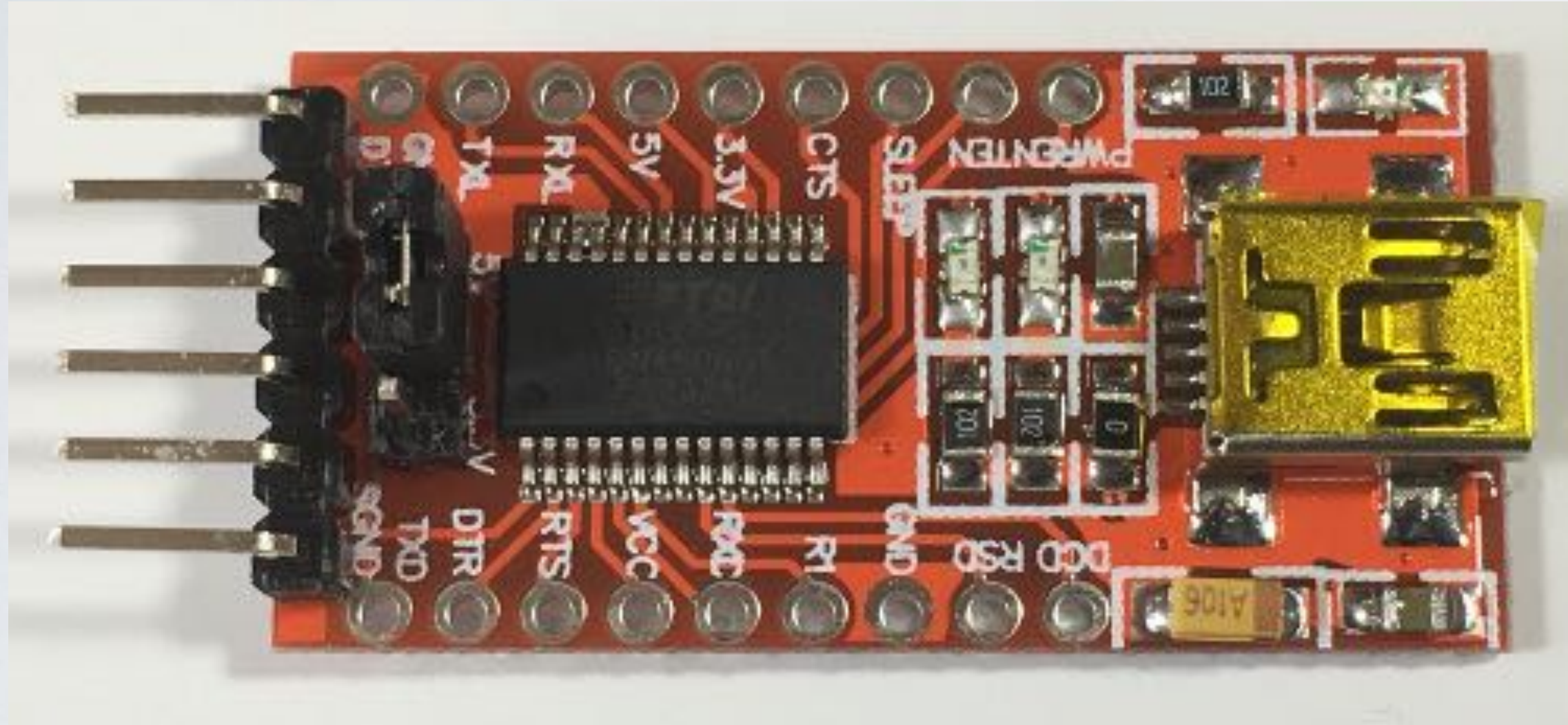


ESP-01S (ESP8266) WIFI MODULE

- Operating temperature: -20°C to 85°C
- Not breadboard friendly
- Number of pins: 8
- Number of GPIO ports: 2 (GPIO0 and GPIO2)
- Not shielded
- One led (blue), will flash when data is transmitted



USB TO TTL CONVERTER



USB TO TTL CONVERTER

- To upload an Arduino sketch or firmware to the ESP-01S module an USB to TTL Serial converter is needed. They are also known as USB-TTL converters, USB FTDI converters or FTDI adapters.
- FTDI (Future Technology Devices International) is a company who produces the most well-known USB-Serial converter chips.
- The USB-TTL converter, converts USB data signals to and from TTL-level serial data.
- Serial data is transmitted one bit at a time at a specified data rate (i.e. 9600bps, 115200bps, etc.). This method of serial communication is sometimes referred to as TTL serial (Transistor-Transistor Logic). Serial communication at a TTL level will always remain between the limits of 0V and Vcc, which is often 5V or 3.3V. A logic high ('1') is represented by Vcc, while a logic low ('0') is 0V.

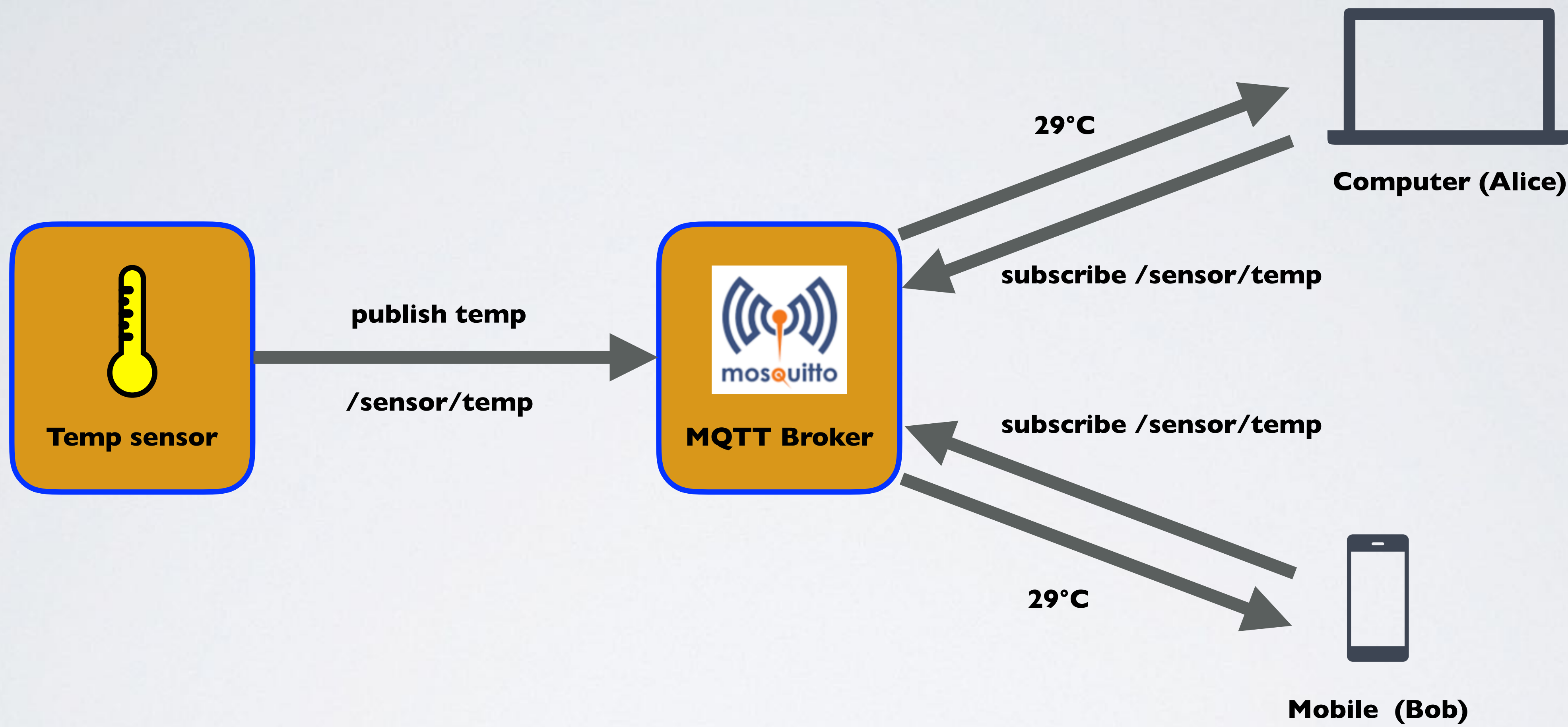
MQTT

- MQTT stands for Message Queuing Telemetry Transport and is a publish/subscribe event-driven messaging protocol for constrained Internet of Things devices and low-bandwidth, high-latency or unreliable networks.
- MQTT enables messages to be pushed to clients.
- The MQTT broker is the central point and is in charge of dispatching all messages between the senders and the rightful receivers.
- Each client that publishes a message to the broker, includes a topic into the message.
- Each client that wants to receive messages, subscribes to a certain topic and the broker delivers all messages with the matching topic to the client.

MQTT

- The client who publish the data and the client who receives the data don't have to know each other, they only communicate over the topic.
- This architecture enables highly scalable solutions without dependencies between the data producers and the data consumers.
- TCP/IP port 1883 is reserved for use with MQTT.
TCP/IP port 8883 is reserved, for use with MQTT over SSL.

MQTT



HOW IT ALL WORKS

