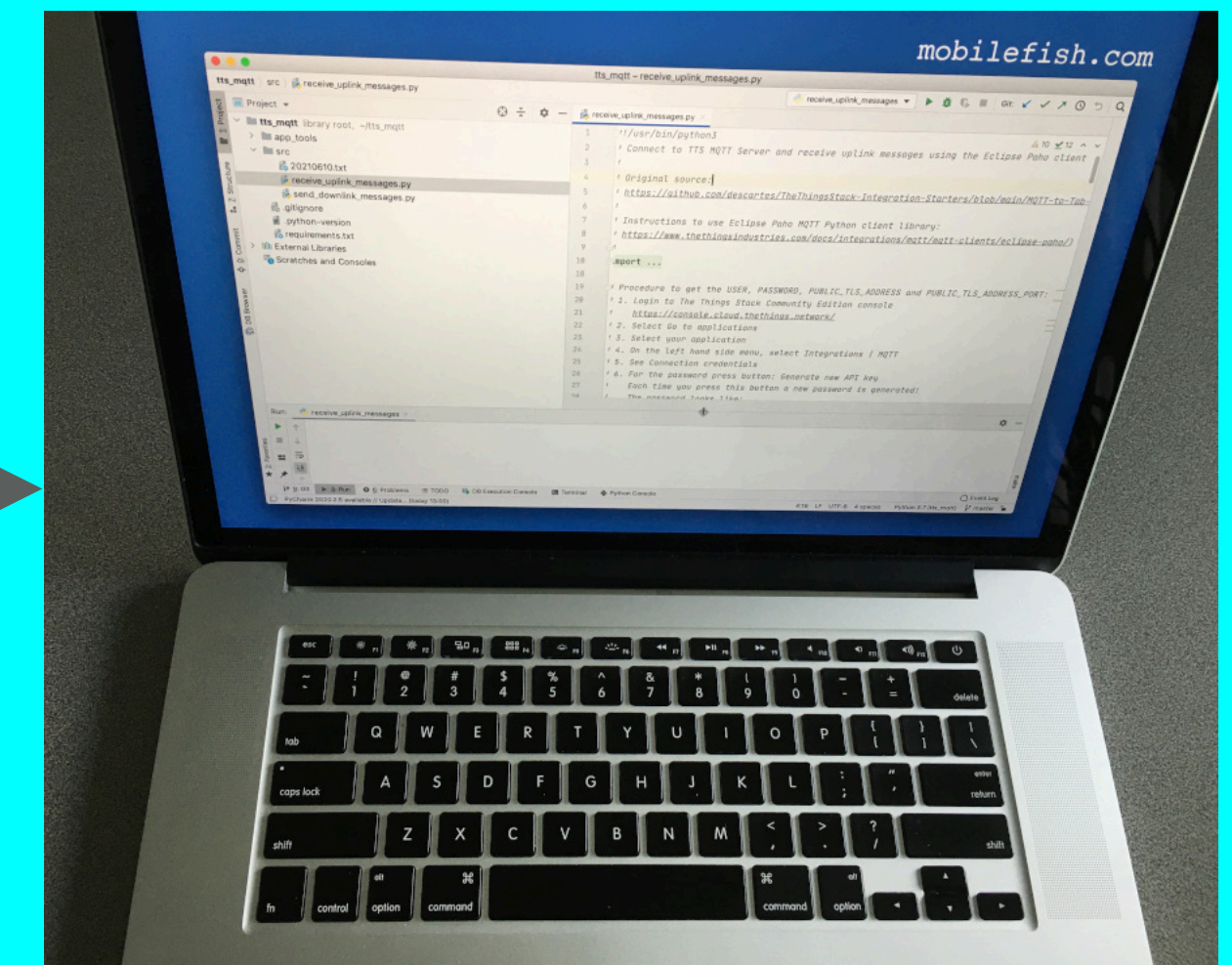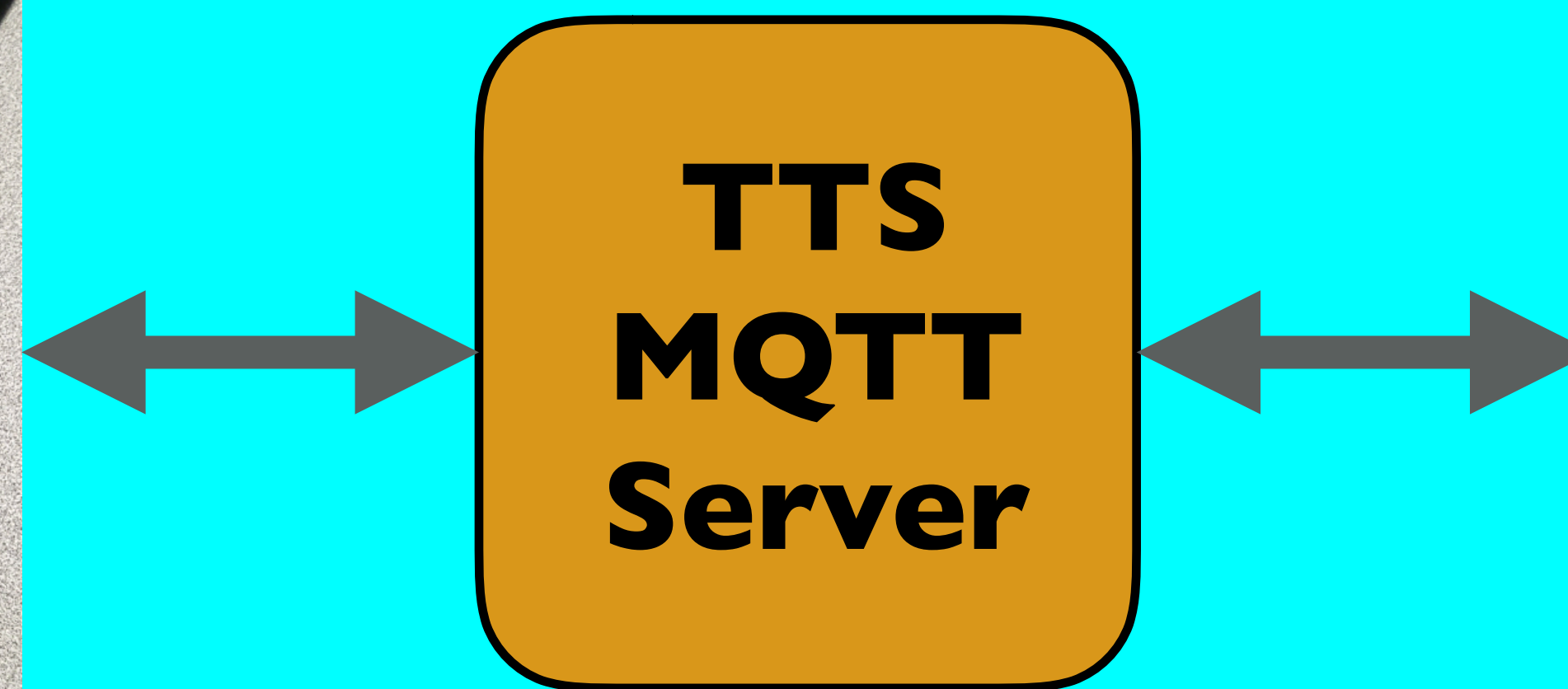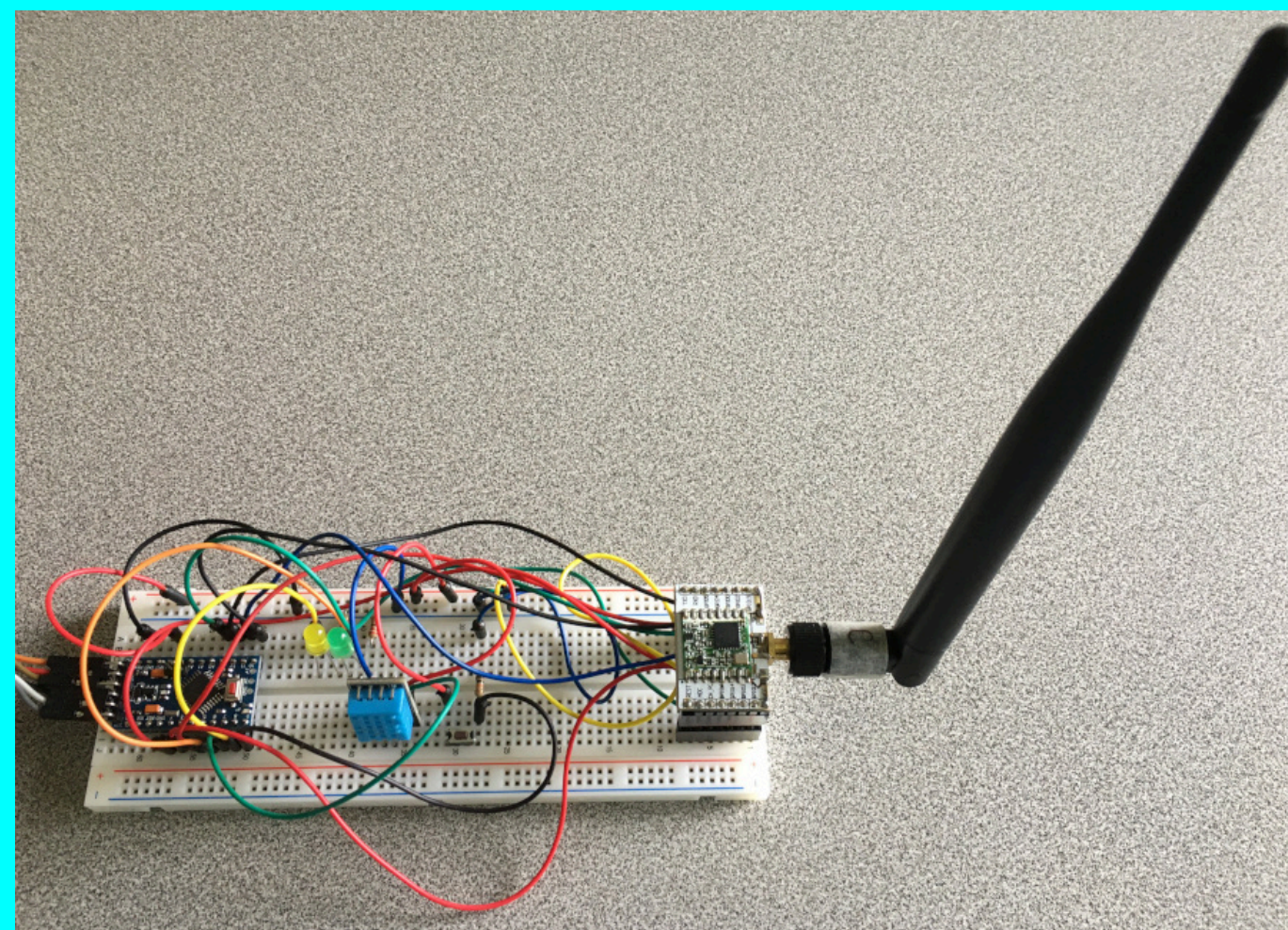mobilefish.com

# LORA / LORAWAN TUTORIAL 58

## Uplink and downlink messages using the Paho MQTT Python client library

v1.0.0

# INTRO

- In this tutorial I will demonstrate a Python script using the Paho MQTT Python client library, which connects to The Things Stack MQTT Server, and receives **uplink messages** from my end node.

- And also in this tutorial I will demonstrate another Python script using the same Paho MQTT Python client library, which again connects to The Things Stack MQTT Server, but now it sends **downlink messages** to my end node.

# PRESENTATION

- This presentation can be found at:
https://www.mobilefish.com/download/lora/lora_part58.pdf

- All my LoRa/LoRaWAN tutorials and presentations can be found at:
https://www.mobilefish.com/developer/lorawan/lorawan_quickguide_tutorial.html

# RECEIVE UPLINK MESSAGES

- This Python script
  https://www.mobilefish.com/download/lora/receive_uplink_messages.py.txt
  receives uplink messages from my end node via The Things Stack MQTT Server by
  using the Paho MQTT Python client library.

- This Python script is tested using Python version: 3.7
  Required library: paho-mqtt (v1.5.1)

- The received uplink messages are:
  - humidity and temperature data (DHT11)
  - button pressed.

# SEND DOWNLINK MESSAGES

- This Python script
  https://www.mobilefish.com/download/lora/send_downlink_messages.py.txt
  sends downlink messages to my end node via The Things Stack MQTT Server by using
  the Paho MQTT Python client library.

- This Python script is tested using Python version: 3.7
  Required library: paho-mqtt (v1.5.1)

# SEND DOWNLINK MESSAGES

• The downlink message is a json object:

```
{
   "downlinks":
   [
      {
         "f_port":3,
         "frm_payload":"AA==",
         "priority": "NORMAL"
      }
   ]
}
```

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# SEND DOWNLINK MESSAGES

- By sending different hex values at fport 3, two leds (yellow and green) can be switched on or off.
  The Python script converts the hex value to its corresponding base64 representation.

| Hex Value | Base64 | Yellow Led | Green Led |
|-----------|--------|------------|-----------|
| 00 | AA== | Off | Off |
| 01 | AQ== | On | Off |
| 02 | Ag== | Off | On |
| 03 | Aw== | On | On |

# END NODE

- The end node in both demos is the same as the one used in tutorial 57.
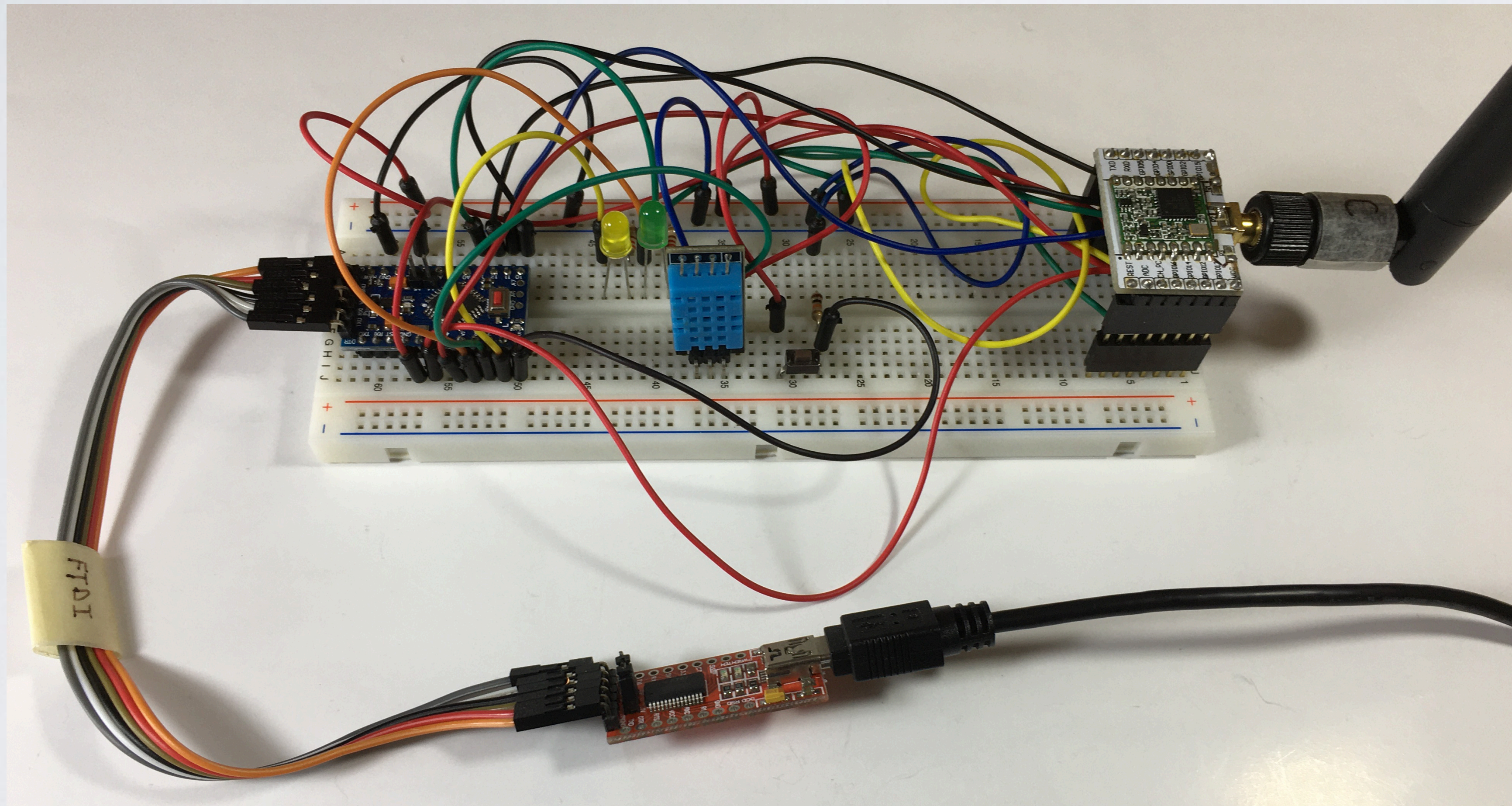
# MORE INFO

- The Python scripts used in this tutorial originates from this Github page
  (Please note: I made several modifications):
  https://github.com/descartes/TheThingsStack-Integration-Starters

- Information about how to work with integrations in The Things Stack:
  https://www.thethingsindustries.com/docs/integrations/
  For example on this page you can find how to connect an to MQTT client and
  subscribe to uplinks or publish downlinks.