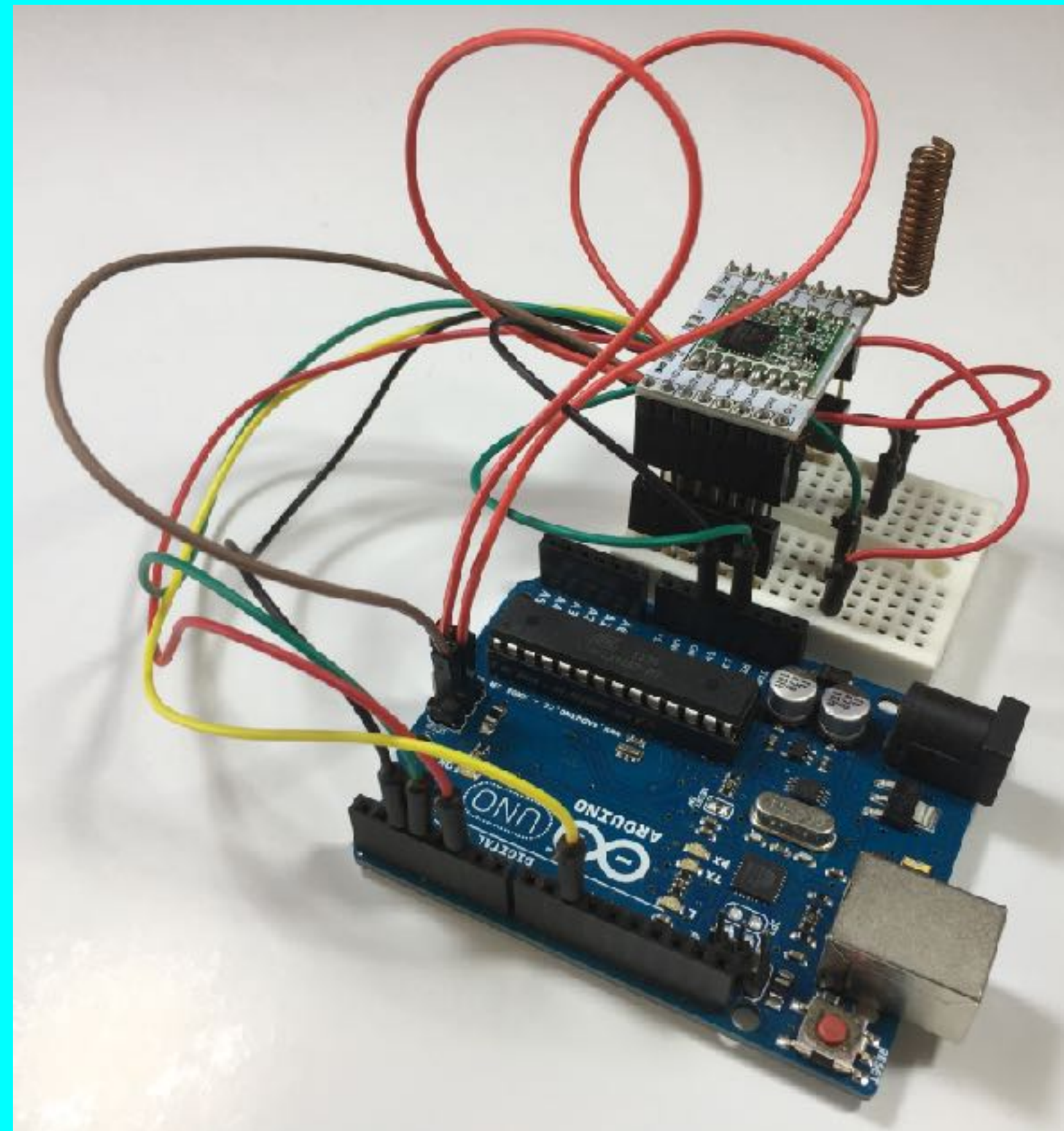


LORA / LORAWAN TUTORIAL 19

LoRa End Nodes

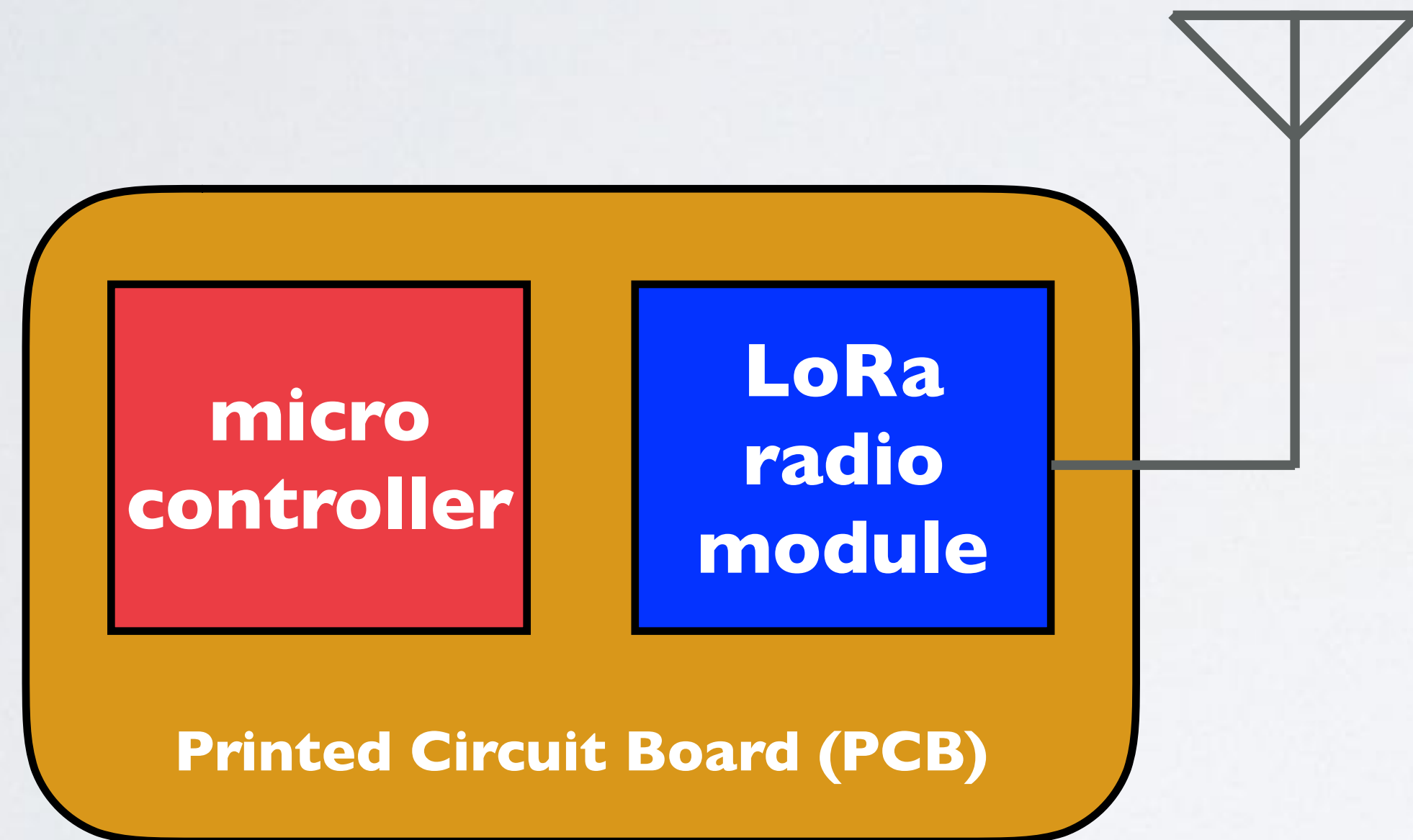


INTRO

- In this tutorial I will explain which LoRa end node products are available today and how you can build your own LoRa development board.

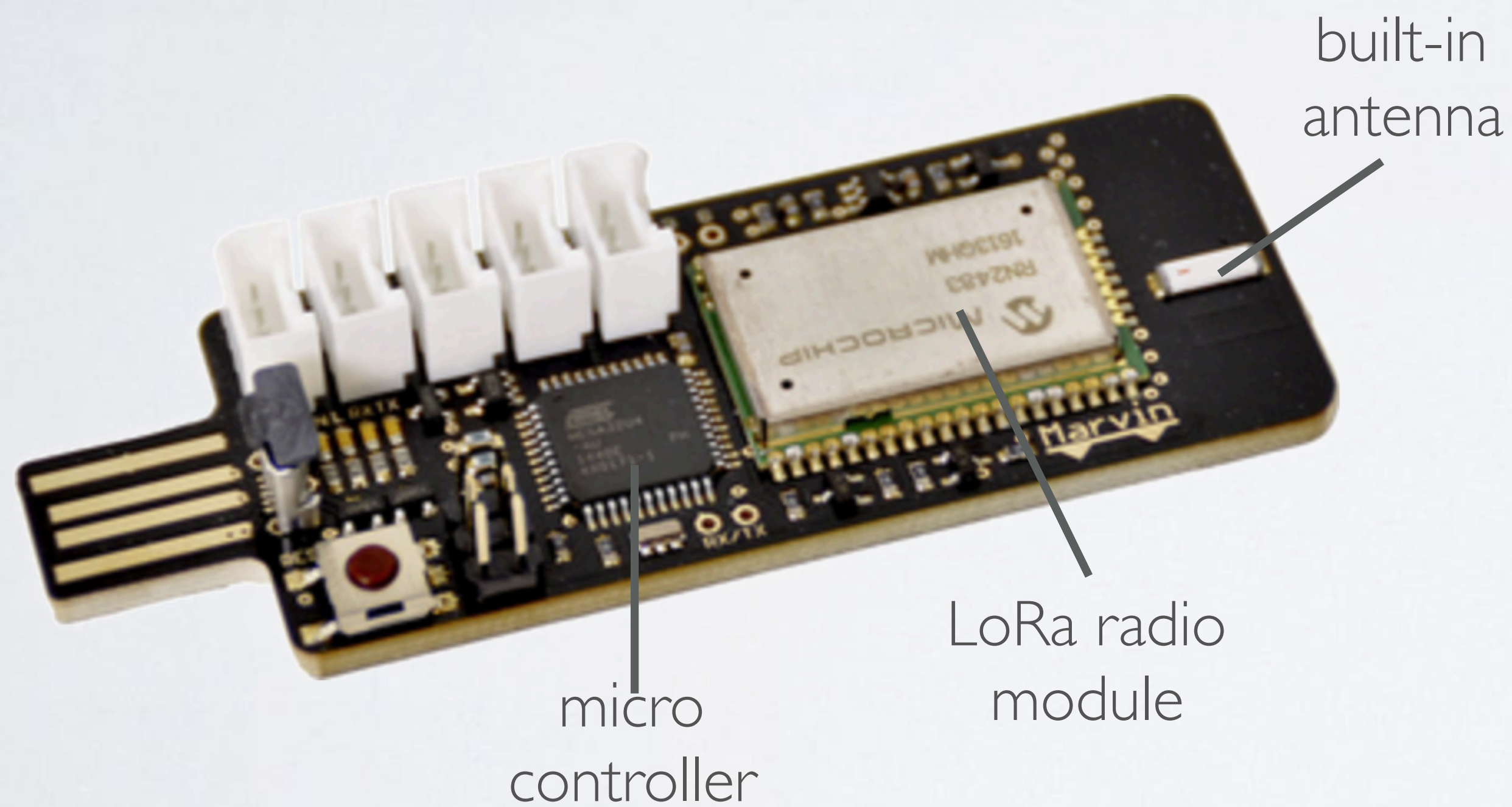
LORA END NODE

- All LoRa end nodes must have a microcontroller (e.g. ATmega32), a LoRa radio module (e.g. SX1276) and an antenna.



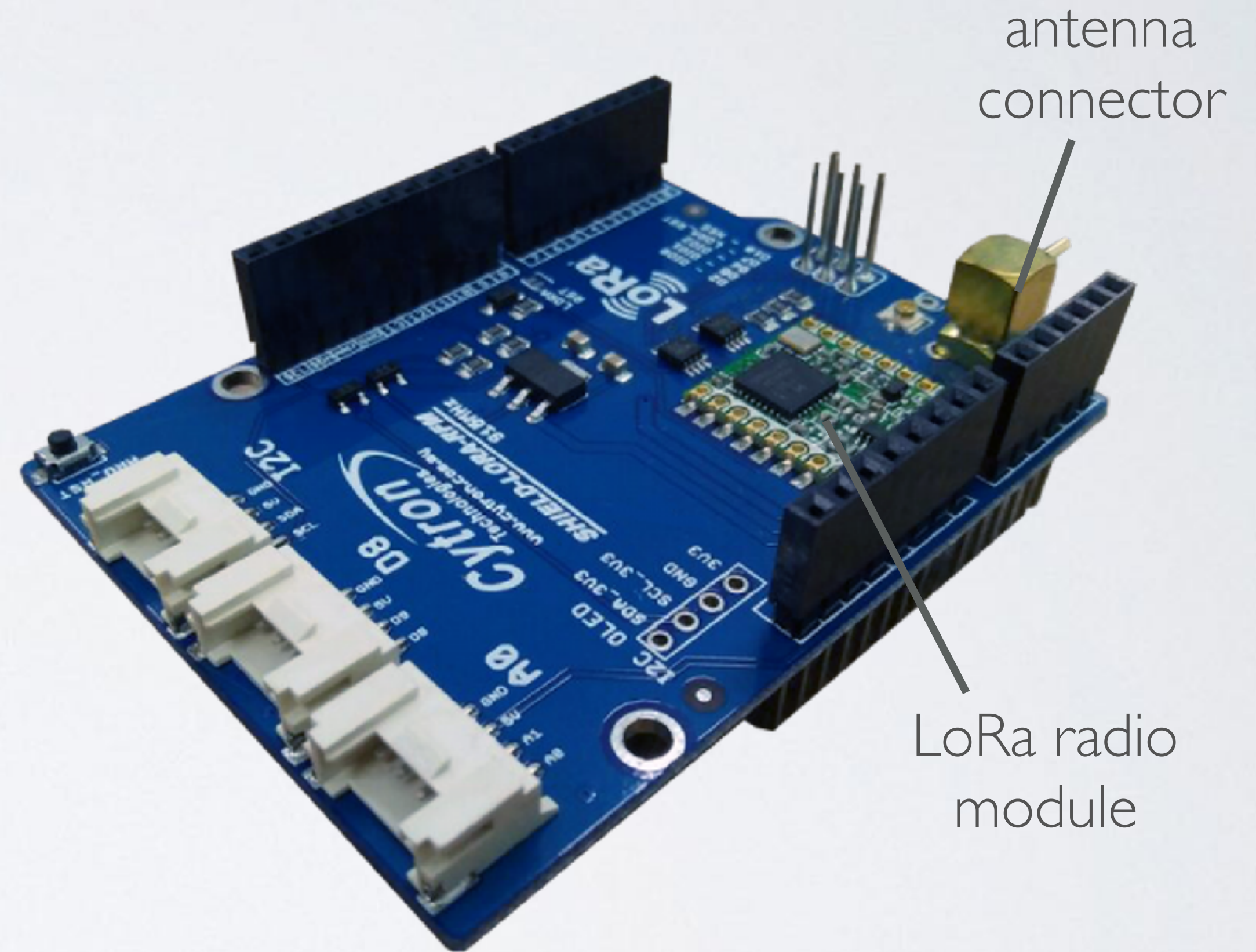
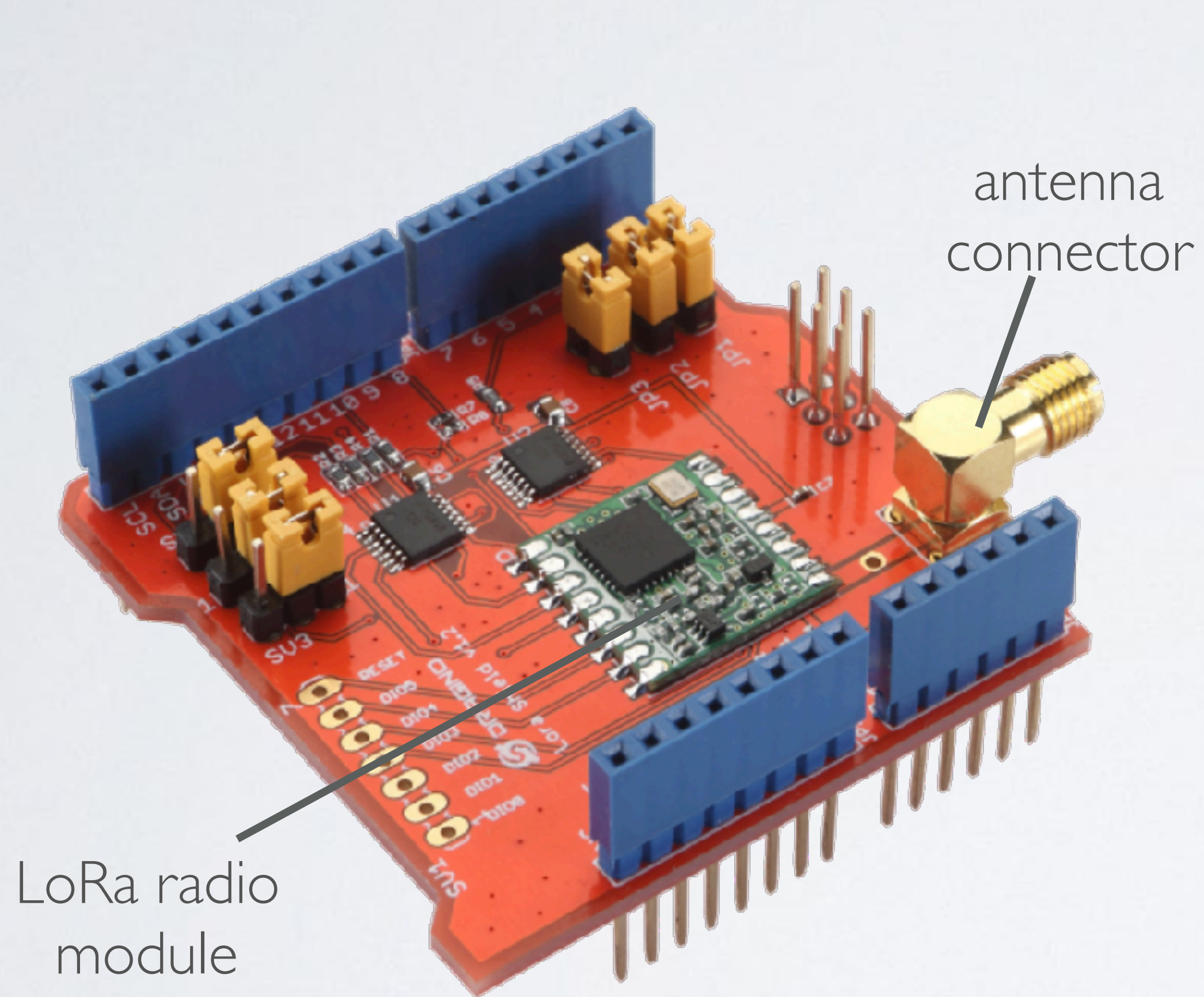
LORA END NODE PRODUCTS

- There are many LoRa end node products available, such as:
 - LoRa development boards where the microcontroller and the LoRa radio module are integrated on a printed circuit board (PCB).



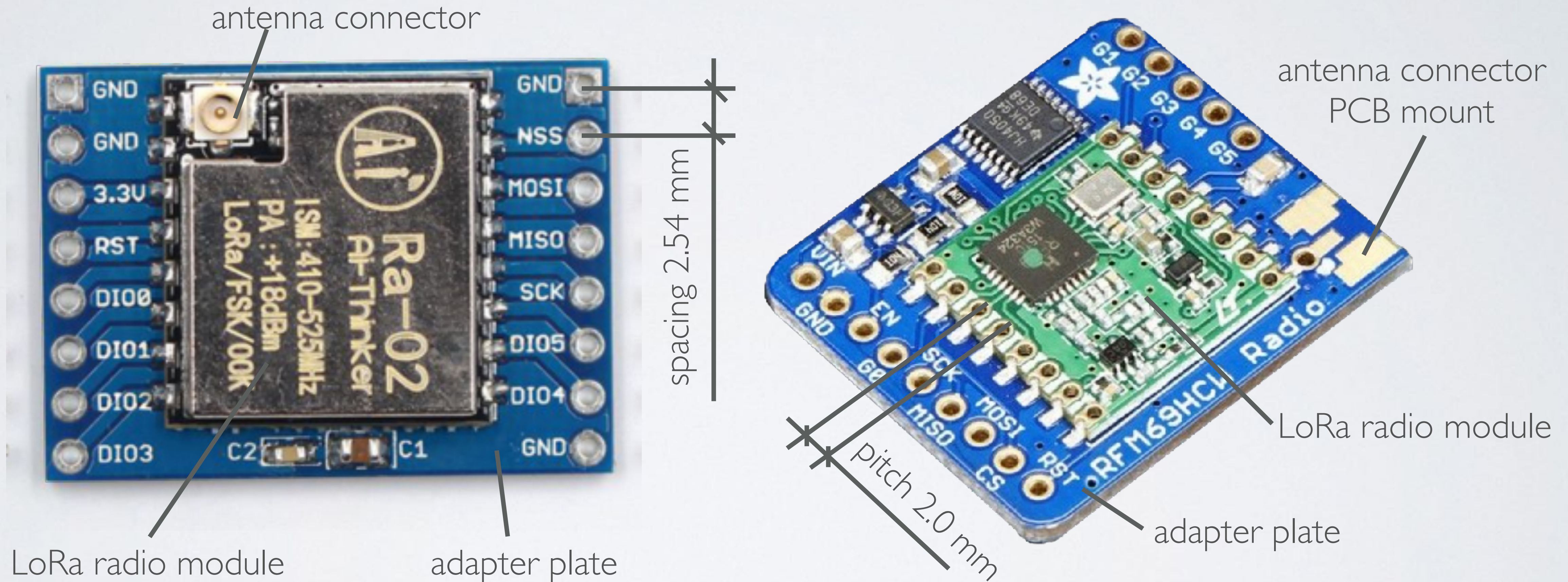
LORA END NODE PRODUCTS

- LoRa radio shields, to be used for example with an Arduino board.



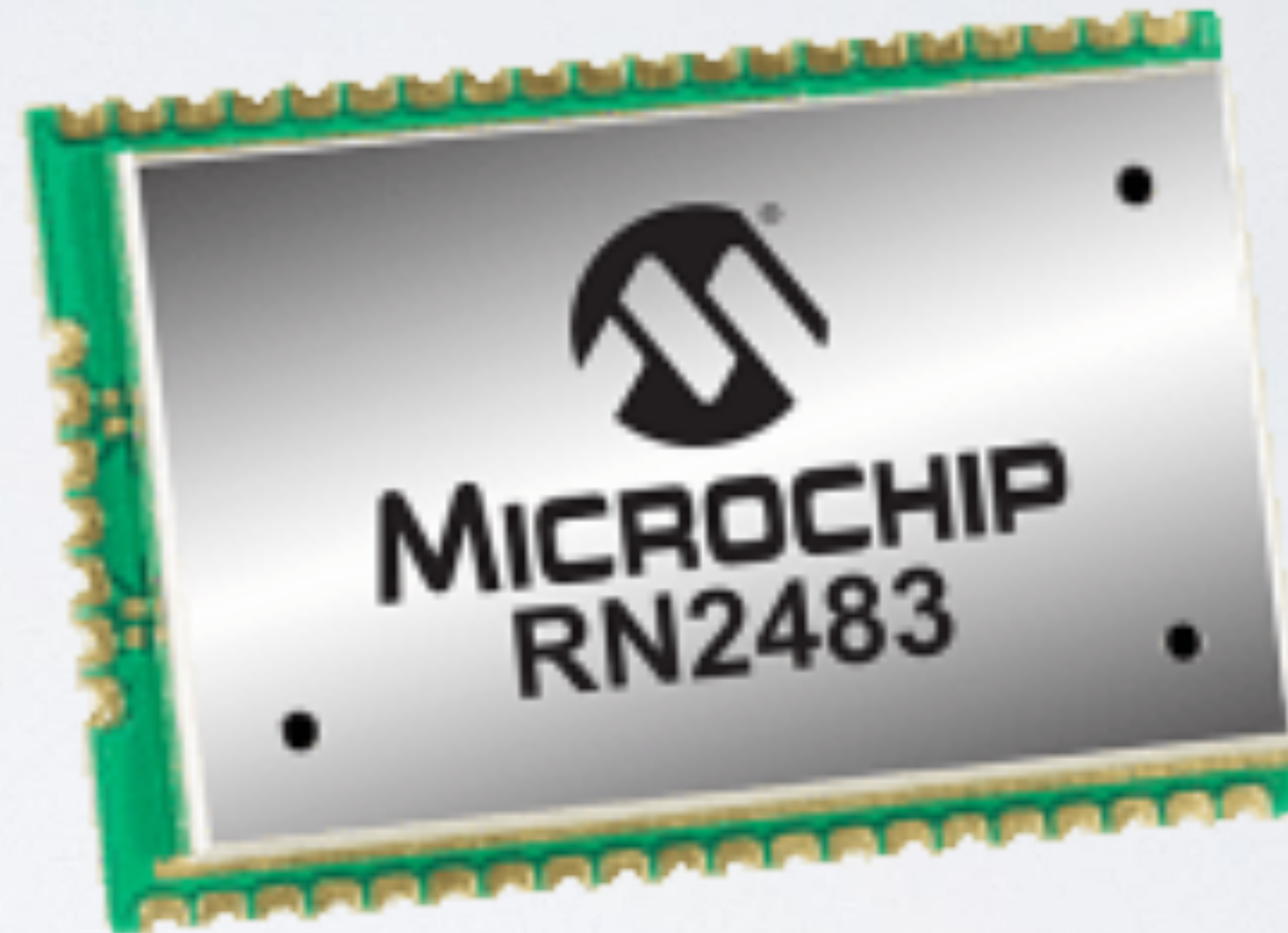
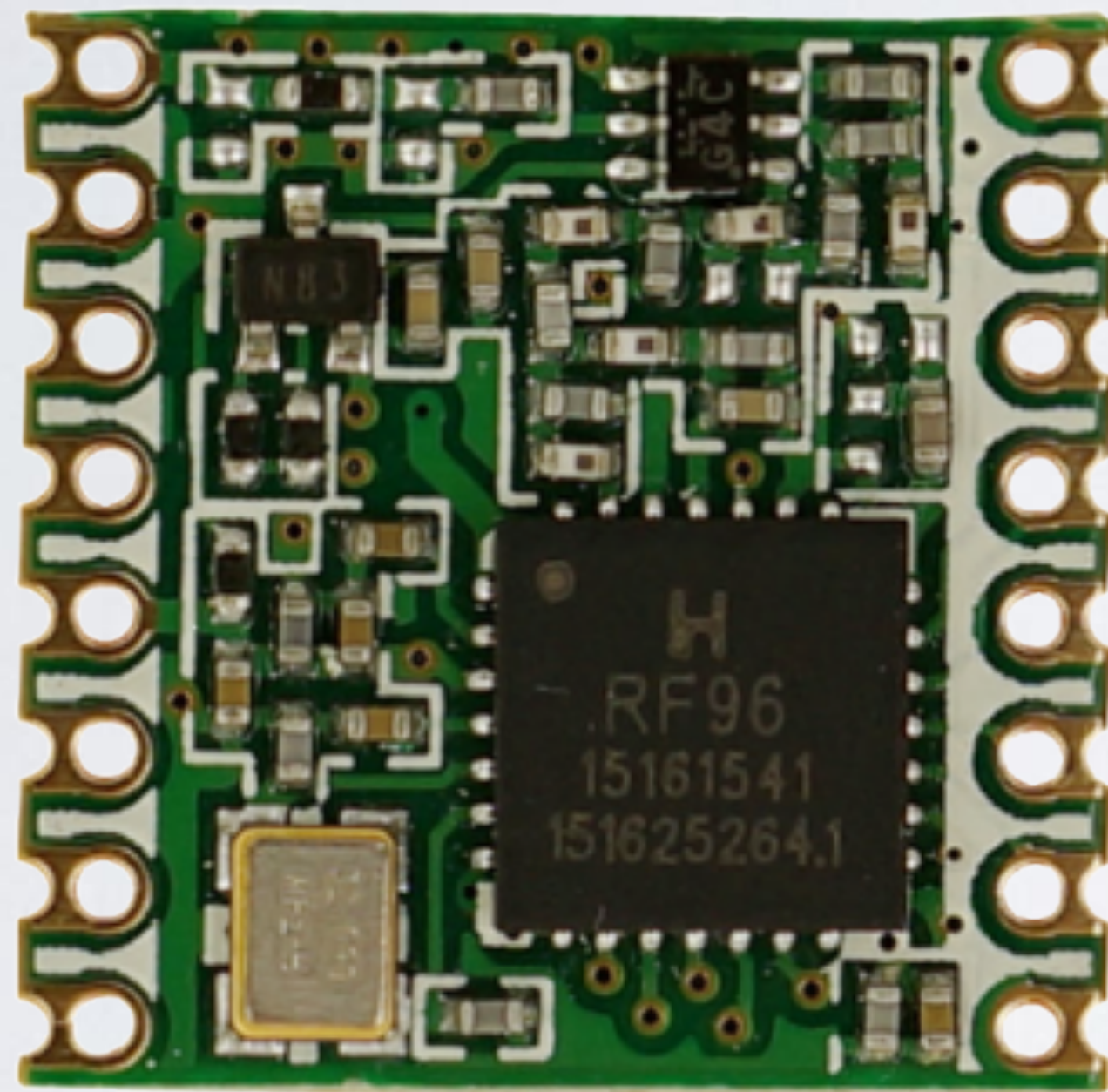
LORA END NODE PRODUCTS

- LoRa breakout boards. The LoRa radio module is mounted on a adapter plate.



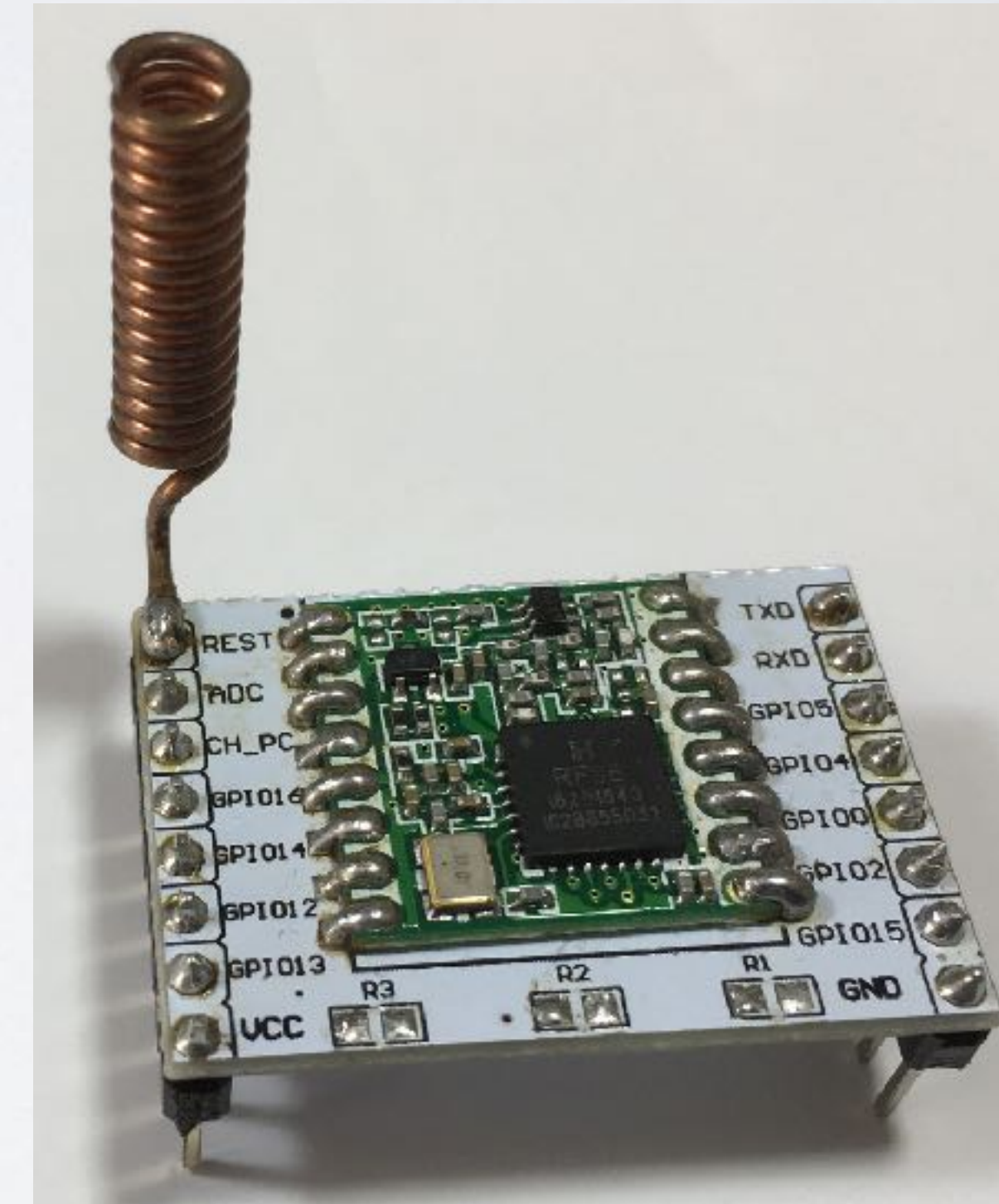
LORA END NODE PRODUCTS

- LoRa radio modules.



SELF BUILD LORA DEVELOPMENT BOARD

- For educational purpose I have build my own LoRa development board.
- LoRa radio module + adapter plate + coil antenna. Total cost: € 8.07
 - HopeRF RFM95 868 MHz
2 pieces (26 Nov 2016): € 13.95 (€ 6.98 / piece)
 - ESP 8266 Wifi adapter plate +
2 pin headers (8 pins, pin diam=2.54mm)
1 piece (26 Nov 2016): € 0.19
 - Copper wire
diameter=1mm, length=1m
1 piece (26 Nov 2016): € 0.90



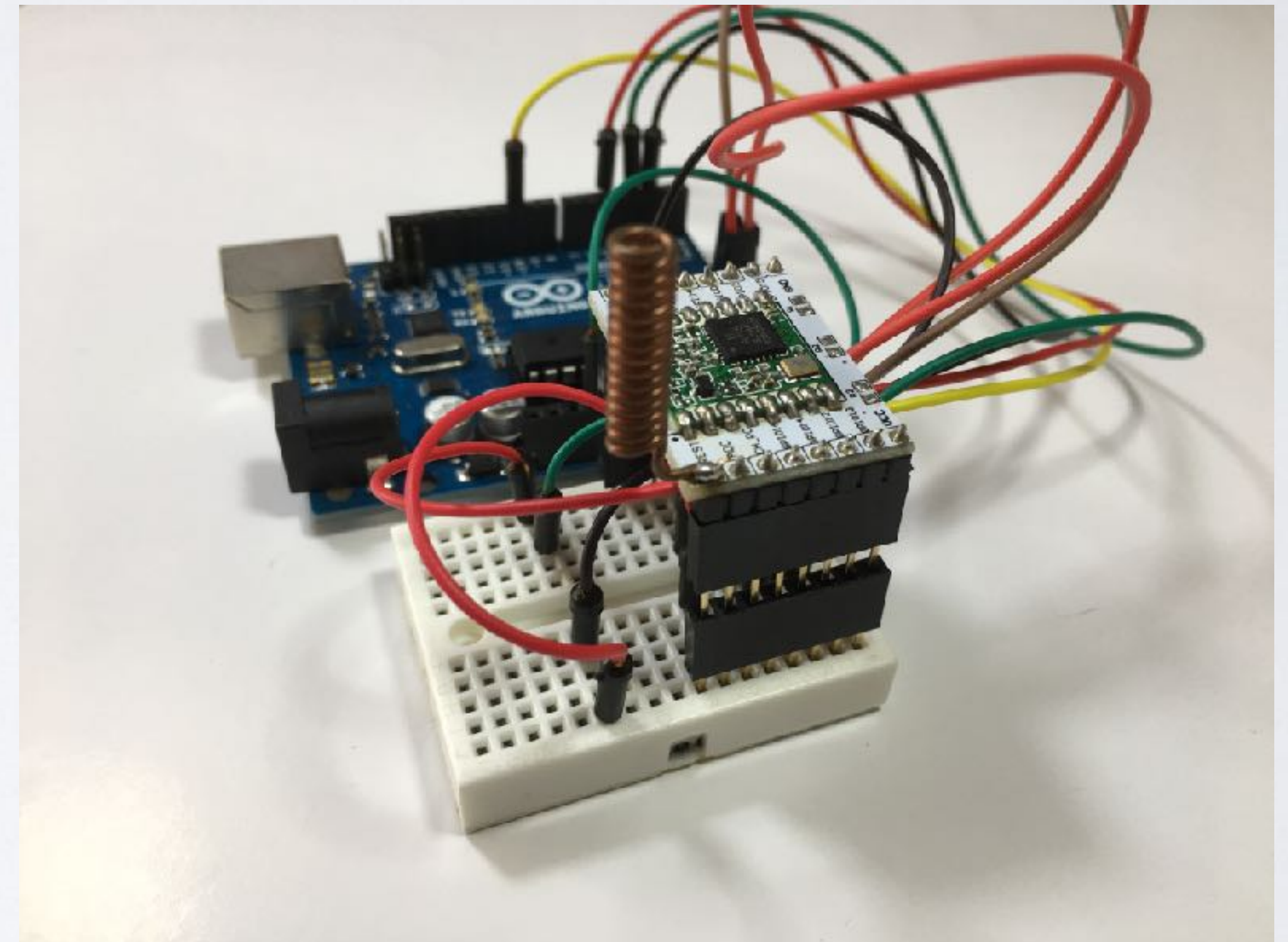
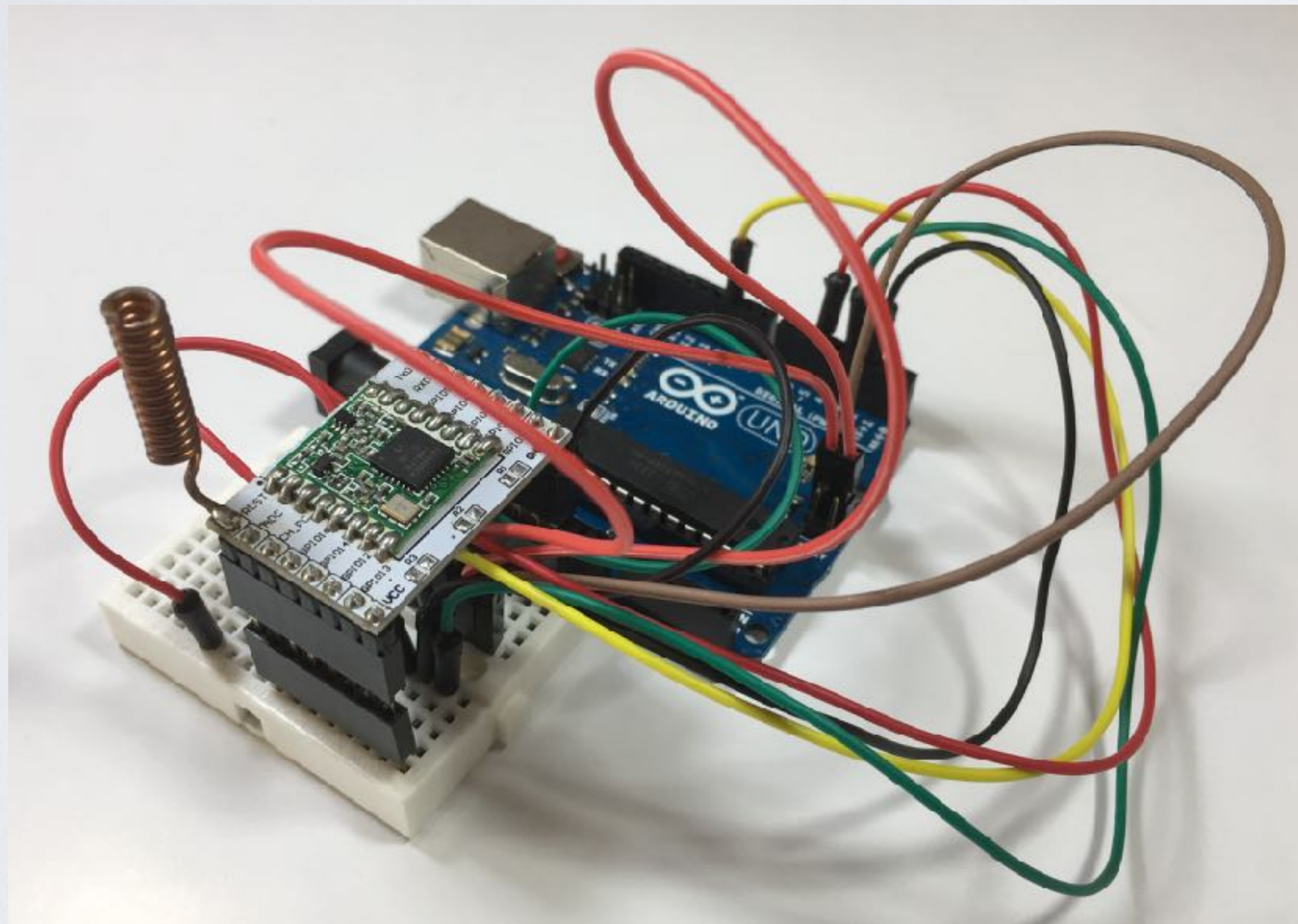
SELF BUILD LORA DEVELOPMENT BOARD

- How the LoRa radio module is mounted on the adapter plate, see: https://www.mobilefish.com/developer/lorawan/lorawan_quickguide_build_lora_node_rfm95_arduino_uno.html
- How the copper 868MHz coil antenna is build, see: https://www.mobilefish.com/developer/lorawan/lorawan_quickguide_build_868mhz_coil_antenna.html



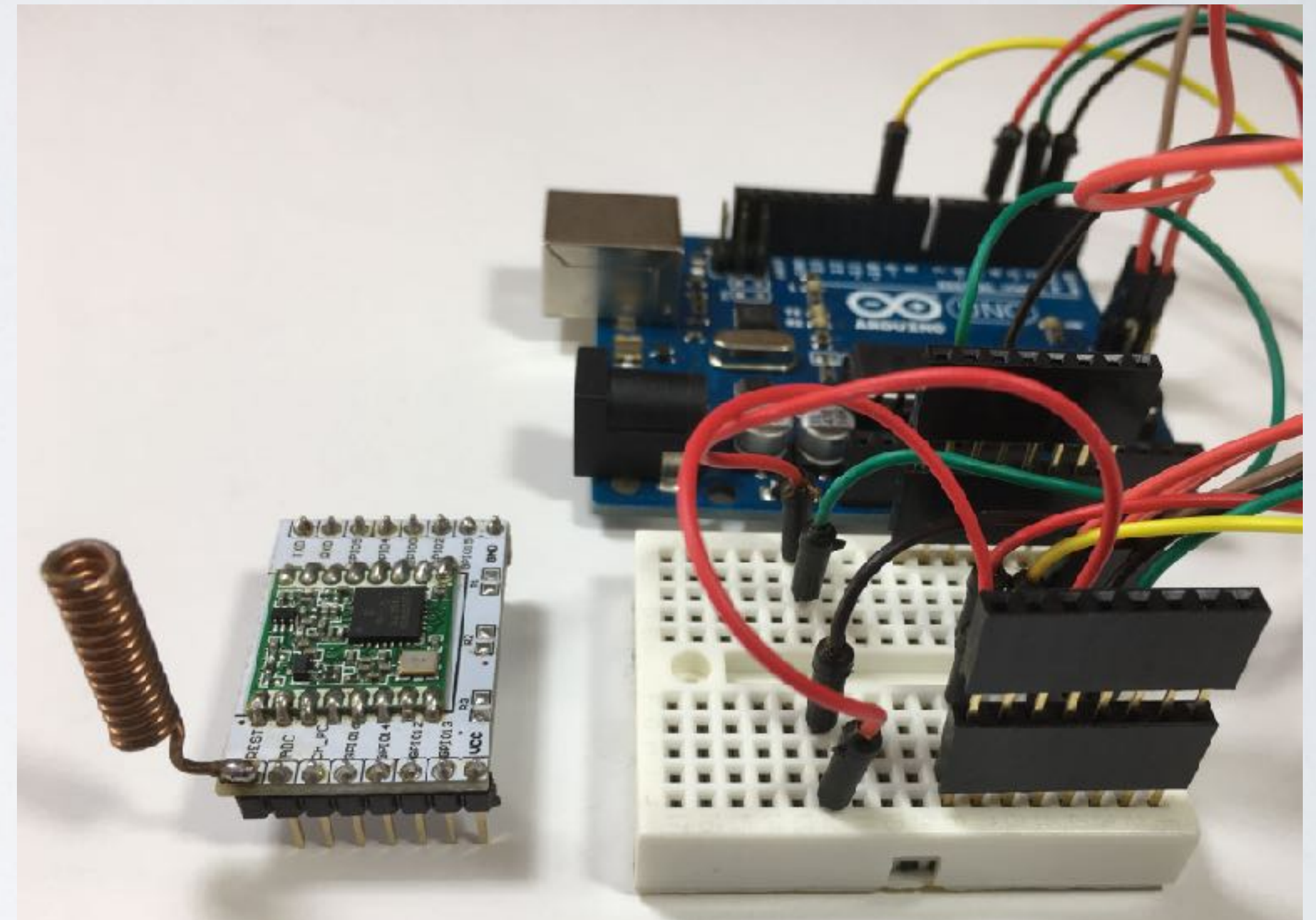
SELF BUILD LORA DEVELOPMENT BOARD

- Arduino Uno (clone) + breadboard + jumper wires + pin headers.
Total cost: € 5.56



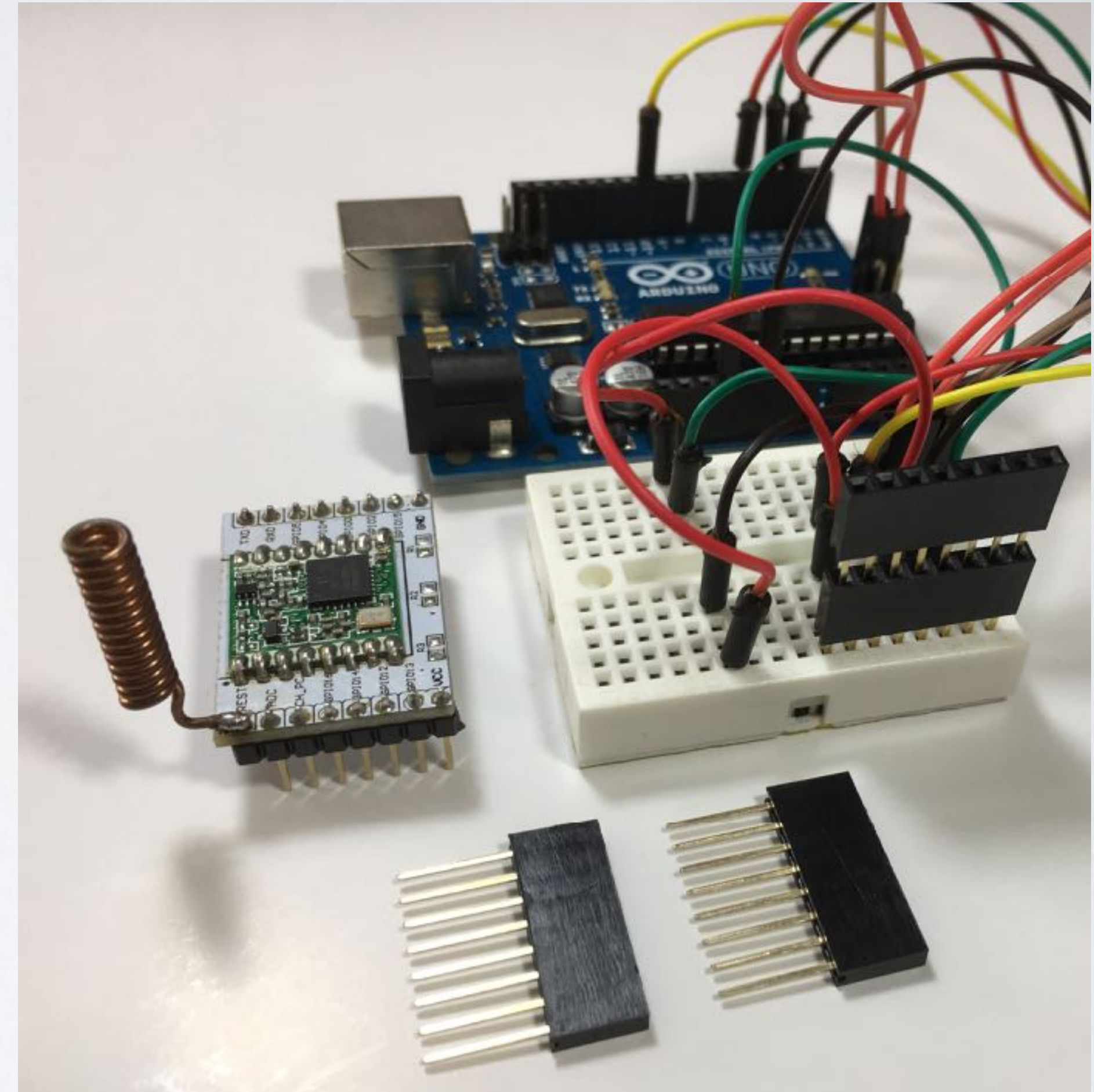
SELF BUILD LORA DEVELOPMENT BOARD

- Arduino Uno (Clone) + USB cable
1 piece (15 Oct 2018): € 2.69
- Mini breadboard (SYB-170)
1 piece (26 Nov 2016): € 0.34
- Jumper wires (m-f)
length=20cm, pin diam=2.54mm
40 pieces (24 Jul 2016): € 0.88
Only 3 pieces are needed in this project.



SELF BUILD LORA DEVELOPMENT BOARD

- Jumper wires (m-m)
length=20cm, pin diam=2.54mm
40 pieces (24 Jul 2016): € 0.88
Only 9 pieces are needed in this project.
- Pin header
8 pins, pin diam=2.54mm
10 pieces: € 0.77
Only 4 pieces are needed in this project.



SELF BUILD LORA DEVELOPMENT BOARD

- The self build LoRa development board. Total cost: € 13.63
 - LoRa radio module + adapter plate + coil antenna. Total cost: € 8.07
 - Arduino Uno (clone) + breadboard + jumper wires + pin headers. Total cost: € 5.56
- Note:
The above mentioned products can be found on AliExpress:
<https://www.aliexpress.com> (Chinese webshop)

SELF BUILD LORA DEVELOPMENT BOARD

- Based on this self build LoRa development board, I will explain in the next video's:
 - Which LoRa end node library to install on the Arduino board and how to configure it.
 - How to register this LoRa end node on The Things Network.
 - How to install a temperature and humidity sensor (DHT-11) on this development board.
- Please note: I assume you have access to a LoRa gateway.