



LOW-COST HARDWARE



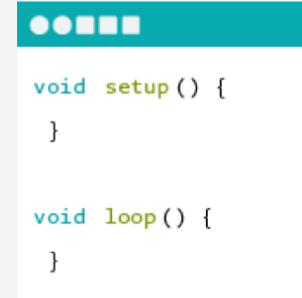
WHAT IS ARDUINO?

Arduino is an open-source electronics platform based on easy-to-use hardware and software. It's intended for anyone making interactive projects.



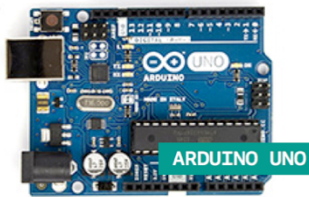
ARDUINO BOARD

Arduino senses the environment by receiving inputs from many sensors, and affects its surroundings by controlling lights, motors, and other actuators.

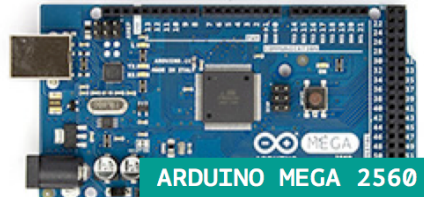


ARDUINO SOFTWARE

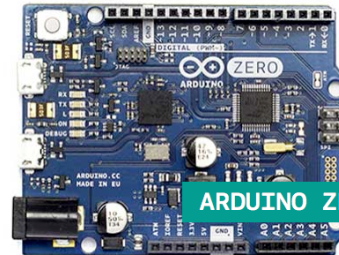
You can tell your Arduino what to do by writing code in the Arduino programming language and using the Arduino development environment.



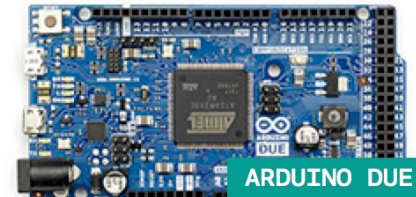
ARDUINO UNO



ARDUINO MEGA 2560



ARDUINO ZERO



ARDUINO DUE



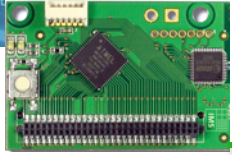
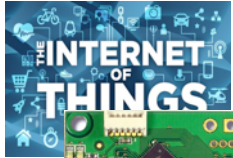
ARDUINO MICRO



ARDUINO PRO MINI



ARDUINO NANO

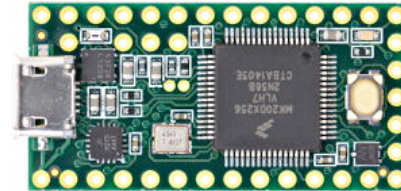
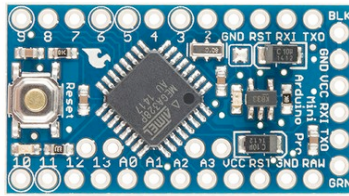


THE DIY ECOSYSTEM



- ❑ Many powerful microcontroller boards available
- ❑ Do-It-Yourself approach with off-the-shelves components more adapted

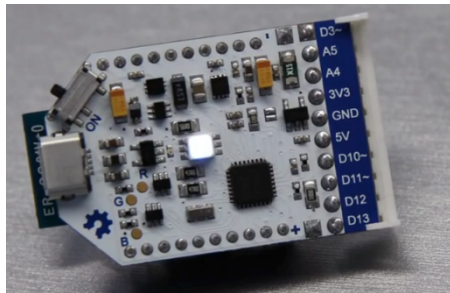
Arduino Pro Mini



Teensy 3.2



STM32 Nucleo-32



Theairboard on kickstarter



Tinyduino



WHY GO FOR ARDUINO?



Avec la bootloader 1 pcs **Pro Mini ATMEGA328 Pro Mini 328 Mini ATMEGA328 3.3 V / 8 MHz pour Arduino**

[View original title in English](#)

★★★★★ **4.9** (417 Votes) | 434 Commandes

Prix : **€ 1,49** / Kit

 Trouvez plus de deals sur l'App

Livraison : **€ 0,29 vers France via China Post Ordinary Small Packet Plus**

Livraison : 15-34 jours (envoyé en 7 jours ouvrables)

Quantité : Kit (55350 Kits available)

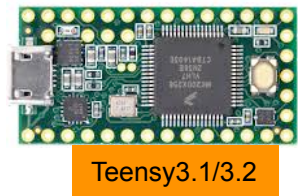
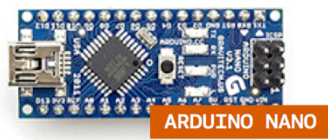
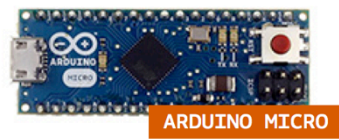
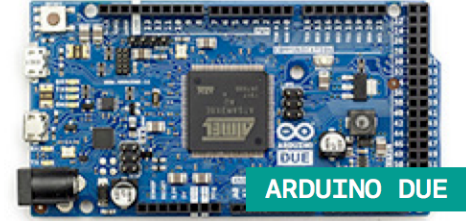
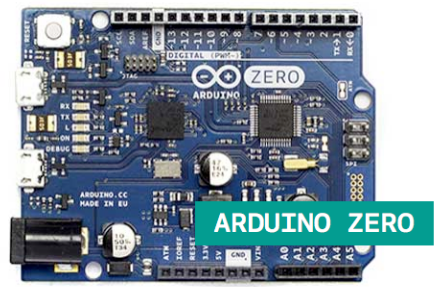
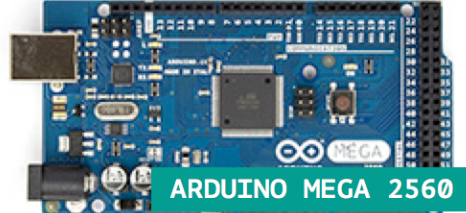
Montant total : **€ 1,78**

Acheter maintenant **Ajouter au panier**

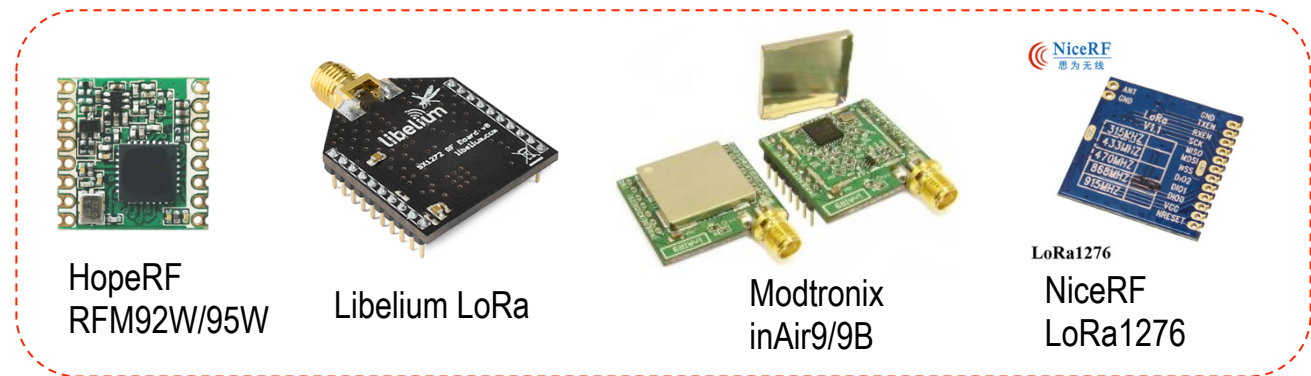
- Cheap, open, and easy to use/program
- huge developer communities
 - Hardware is not the main important issue
 - Software is!



SW/HW BUILDING BLOCKS INTEGRATION



LoRa radios that our library already supports



HopeRF
RFM92W/95W

Libelium LoRa

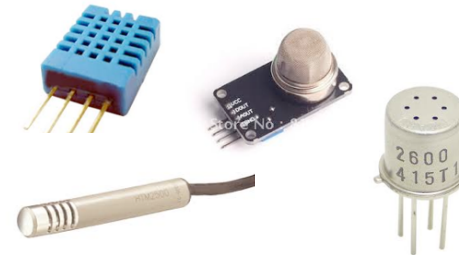
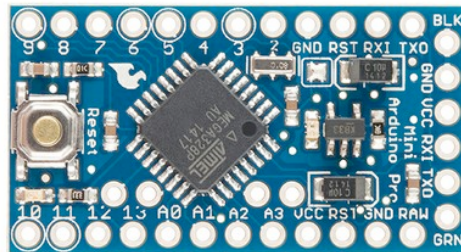
Modtronix
inAir9/9B

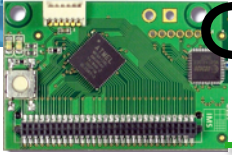
NiceRF
LoRa1276

Long-Range communication library

GENERIC SENSING IOT DEVICE

- ❑ Build low-cost, low-power, Long-range enabled generic platform
- ❑ Methodology for low-cost platform design
- ❑ Technology transfers to user communities, economic actors, stakeholders,...

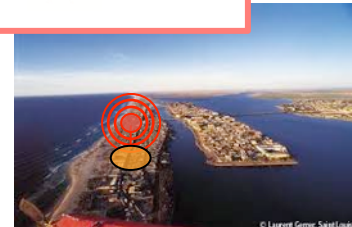
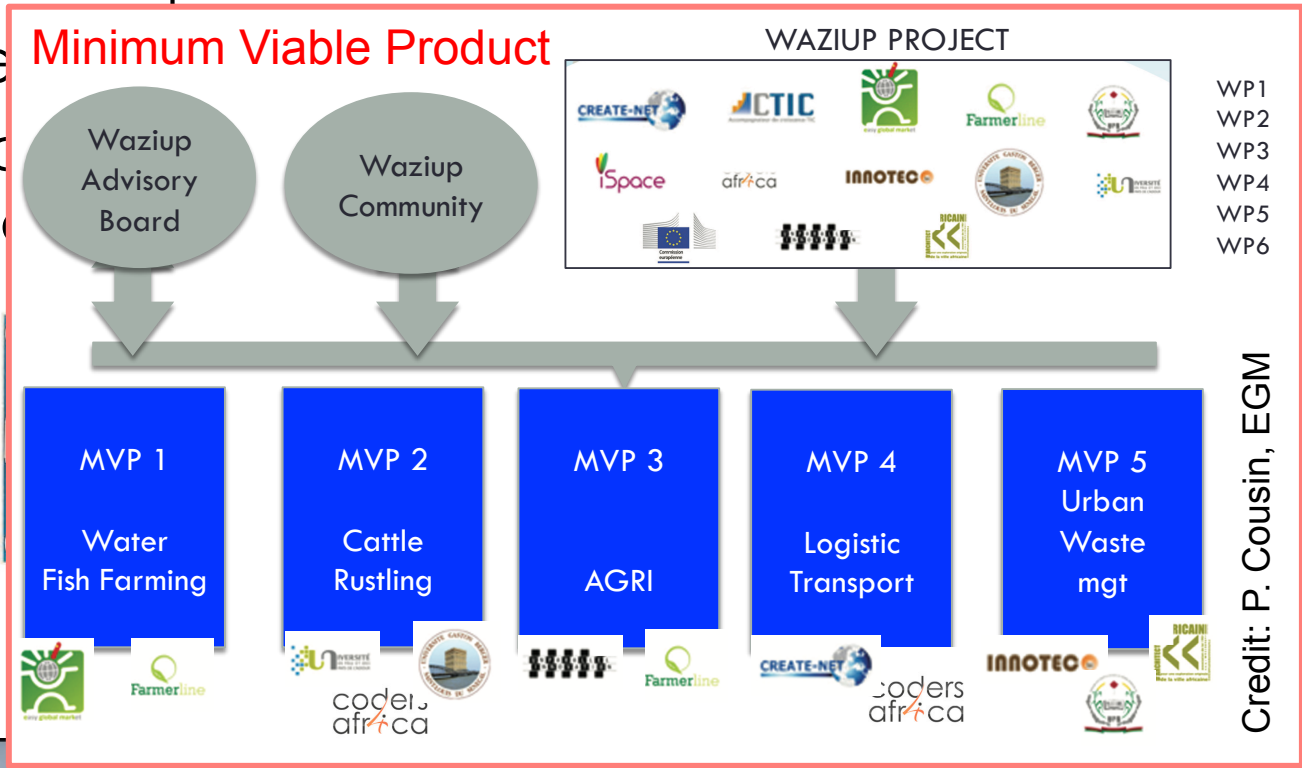


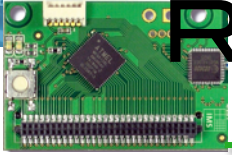


GENERIC SENSING IOT DEVICE

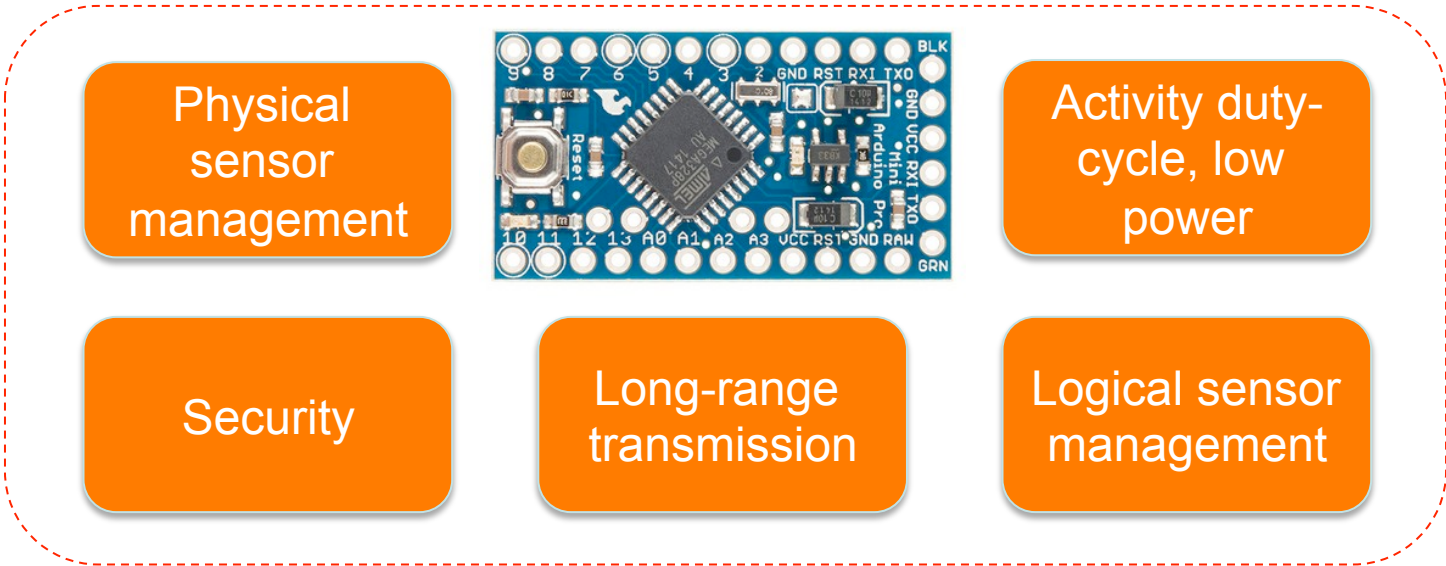
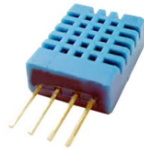
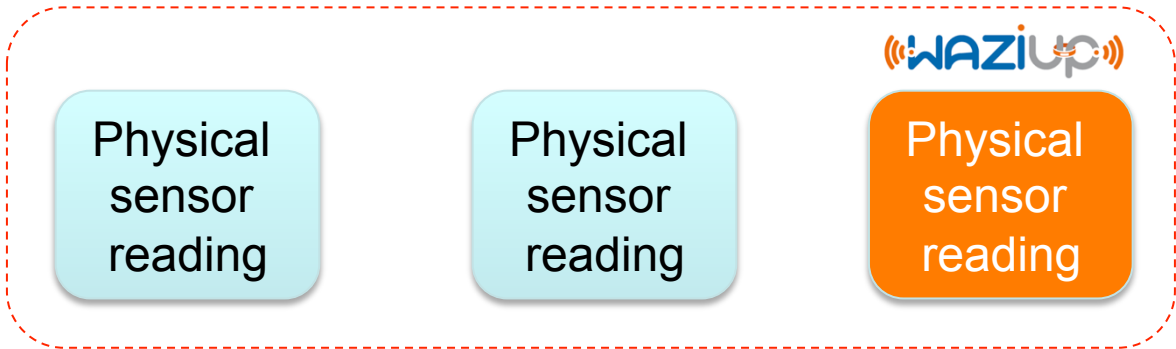


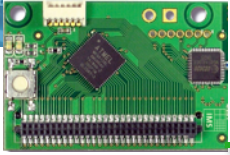
- Build low-cost, low-power, Long-range enabled generic platform
- Me
- Tec
- ec





READY-TO-USE TEMPLATES

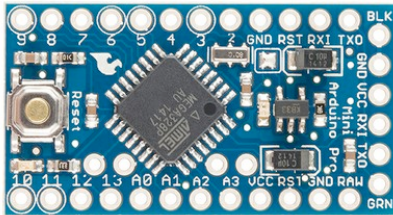




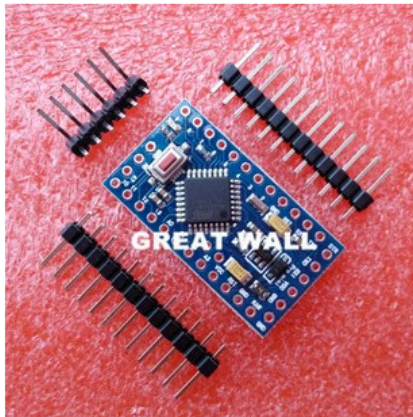
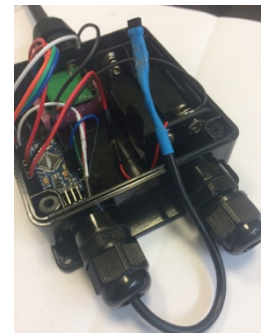
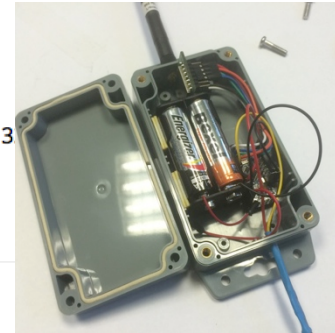
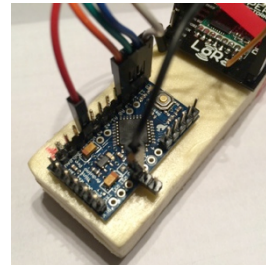
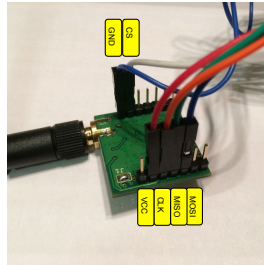
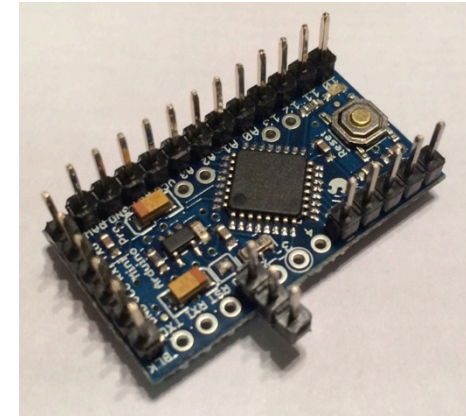
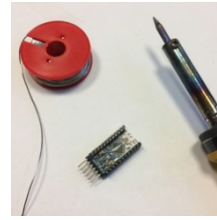
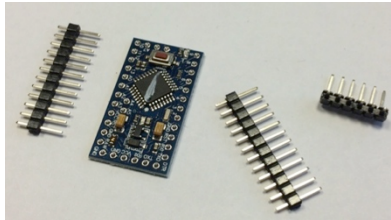
EASY INTEGRATION AND CUSTOMIZATION



Arduino Pro Mini



3.3v and 8MHz version



Avec la bootloader 1 pcs Pro Mini ATMEGA328 Pro Mini 3 MHz pour Arduino

[View original title in English](#)

★★★★★ 4.9 (417 Votes) | 434 Commandes

Prix : € 1,49 / Kit

Trouvez plus de deals sur l'App ▾

Livraison : € 0,29 vers France via China Post Ordinary Small Pac

Livraison : 15-34 jours (envoyé en 7 jours ouvrables)

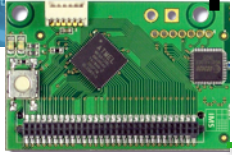
Quantité : Kit (55350 Kits available)

Montant total : € 1,78

Acheter maintenant

Ajouter au panier

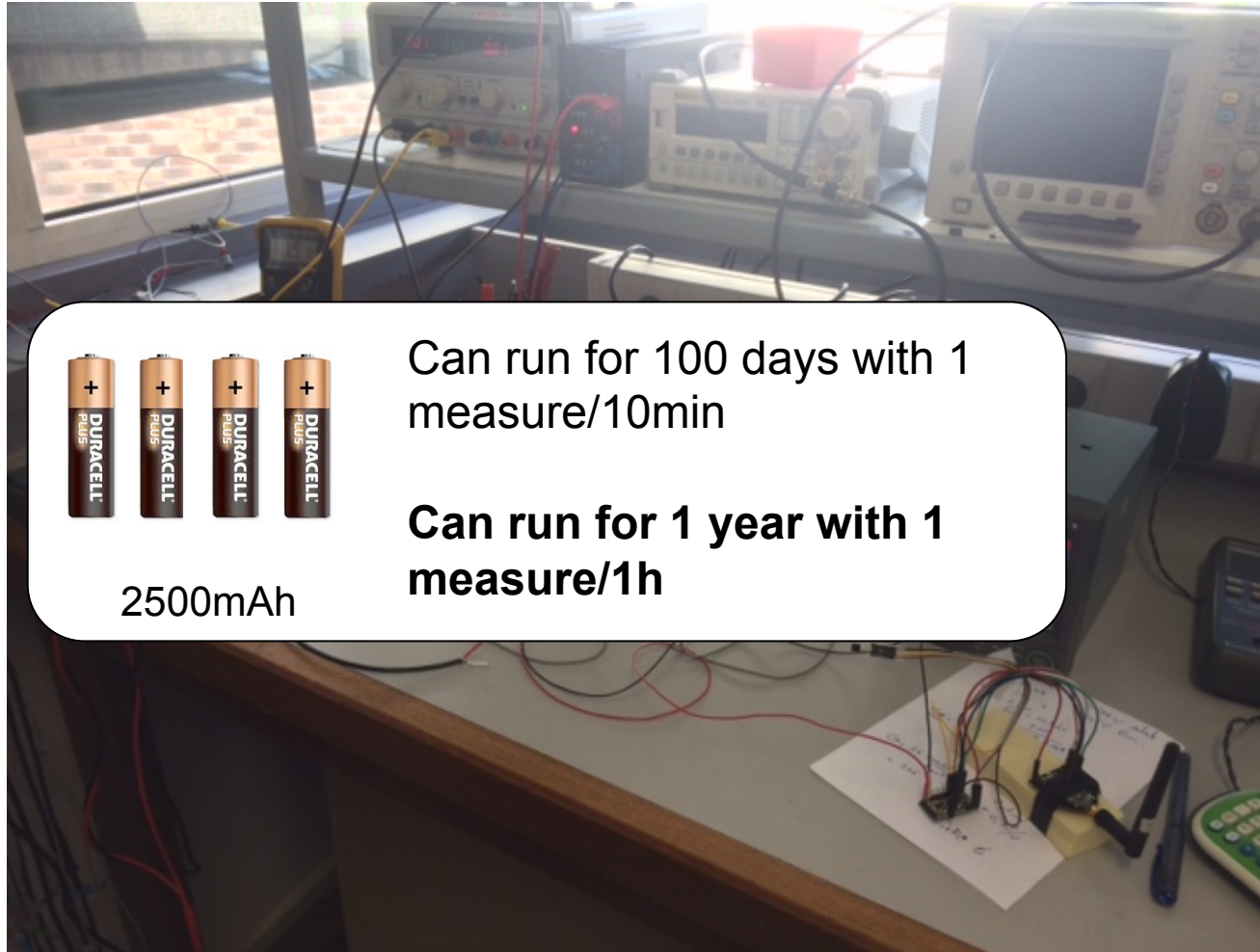




RUNNING FOR 1 YEAR WITH LOW-POWER MODE!



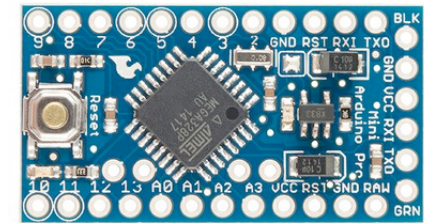
Low-Power library from RocketScream



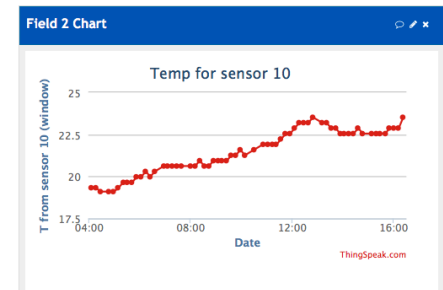
2500mAh

Can run for 100 days with 1 measure/10min

Can run for 1 year with 1 measure/1h

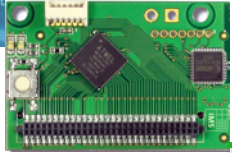


Wakes-up every 10min, take a measure (temp) and send to GW



146µA in deep sleep mode, 93mA when active and sending

Thanks to T. Mesplou and P. Plouraboué for their help



LORA GATEWAYS (NON EXHAUSTIVE LIST)



Multi-Tech Conduit



Embedded Planet
EP-M2M-LORA



Ideeatron Lorank 8



LinkLabs Symphony



Kerlink IoT Station



PicoWAN from
Archos

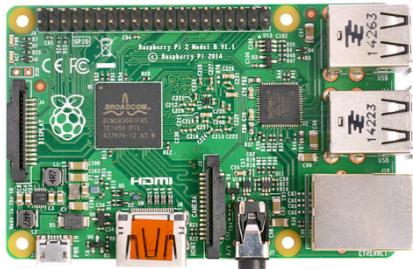
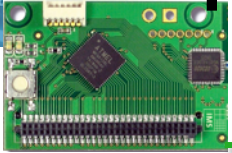


TheThingNetwork

From 250€ to 1500€



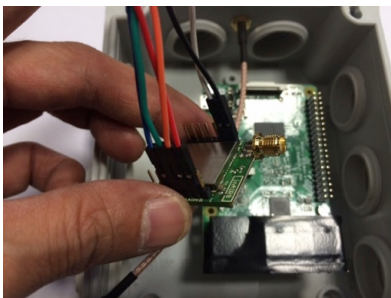
RASPBERRY-BASED LORA GATEWAY

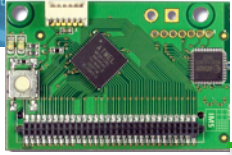


We can use all model of Raspberry. The most important usefull feature is the Ethernet interface for easy Internet connection. Then WiFi and Bluetooth can be added with USB dongles. **RPI3 provides built-in Ethernet, WiFi and Bluetooth!**

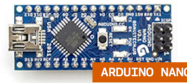
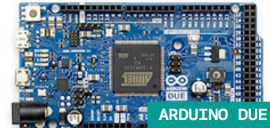
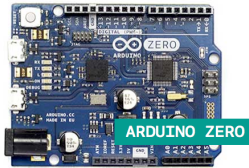
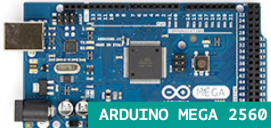


Less than 50€





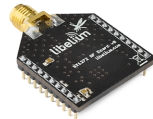
SIMPLICITY!



LoRa radios that our library already supports



HopeRF RFM92W/95W



Libelium LoRa



Modtronix inAir9/9B



NiceRF LoRa1276

Long-Range communication library

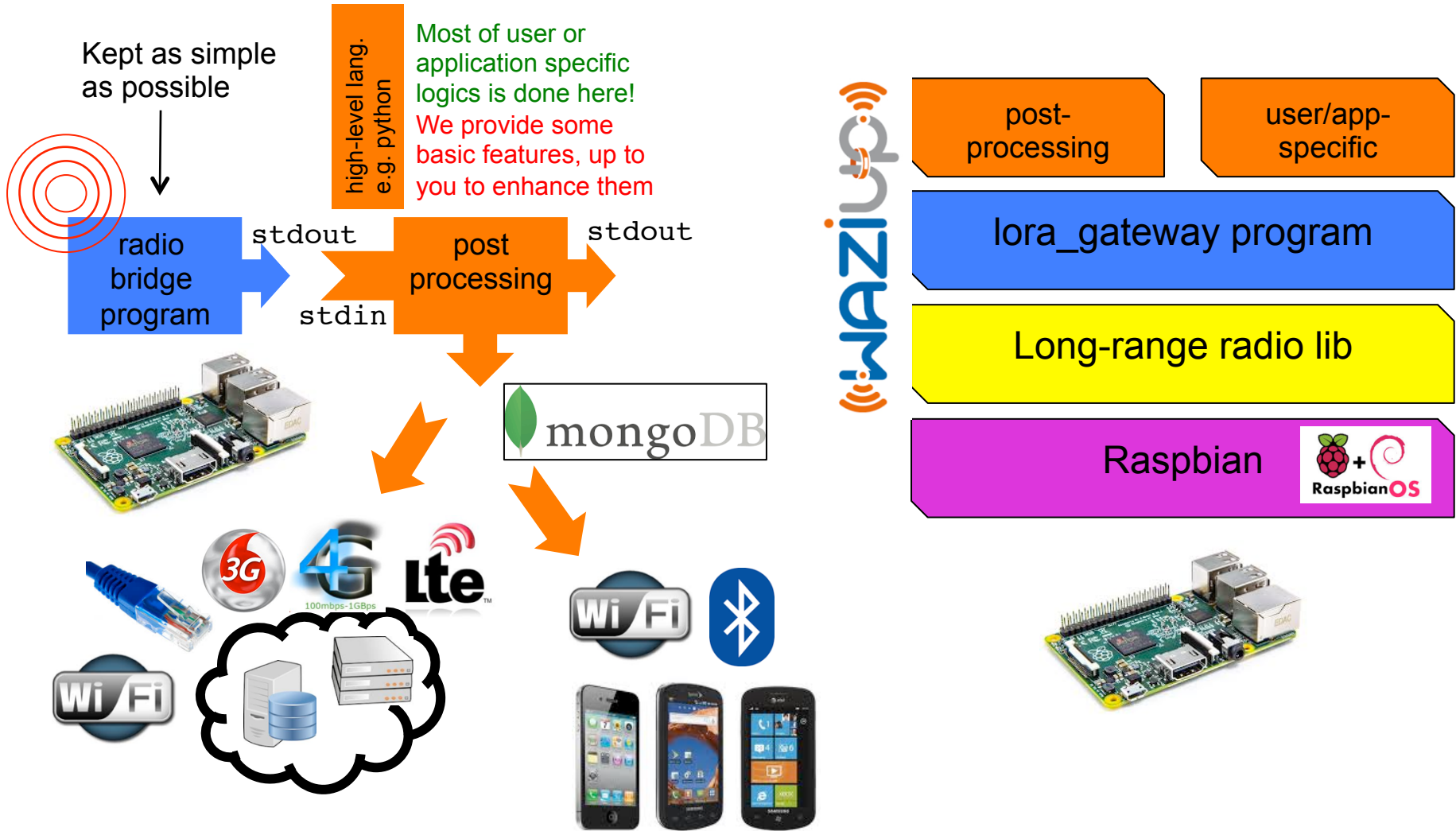


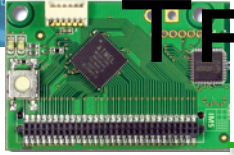
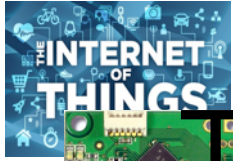
```
sendPacketTimeout("18.5");
// sends to gateway
// 18.5 : temperature message
```

1 send function!



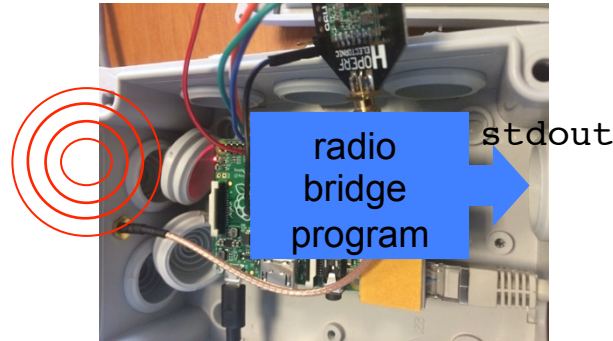
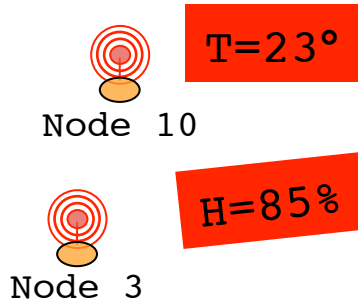
OUR LOW-COST GATEWAY ARCHITECTURE





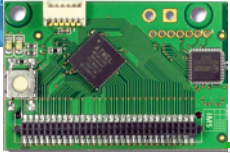
TRANSPARENT LORA BRIDGE

HORIZON 2020

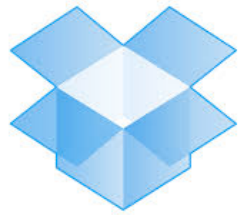


```
> sudo ./lora_gateway
Power ON: state 0
LoRa mode: 4
Setting mode: state 0
Channel CH_10_868: state 0
Power M: state 0
Get Preamble Length: state 0
Preamble Length: 8
LoRa addr 1 : state 0
SX1272/76 configured as LR-BS. Waiting RF input for transparent RF-serial bridge

--- rxloro. dst=1 type=0x10 src=10 seq=0 len=5 SNR=9 RSSIpkt=-54
^p1,16,10,0,5,9,-54
T=23°
--- rxloro. dst=1 type=0x10 src=3 seq=0 len=5 SNR=8 RSSIpkt=-54
^p1,16,3,0,5,8,-54
H=85%
```



IoT CLOUD?



Dropbox



Firestore



FIWARE

Axeda®

ioBridge®
Connect things.

ThingSpeak



GroveStreams



SensorCloud™

freeboard

dweet.io

OpenRemote



TempoIQ