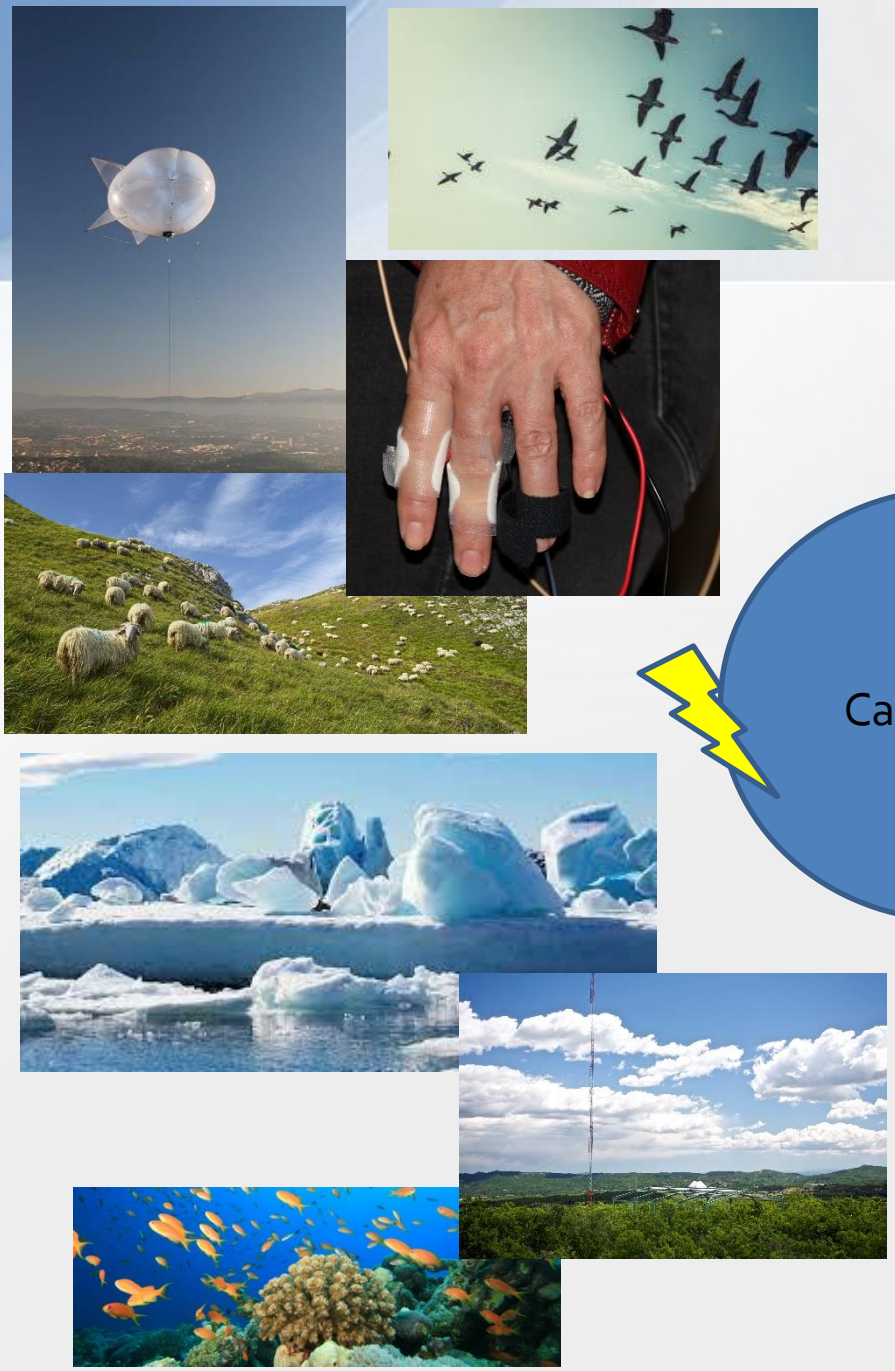
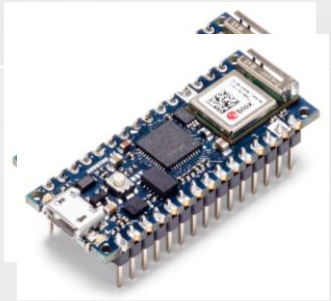
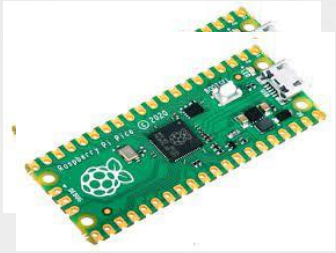
ANF IOT sept 2023

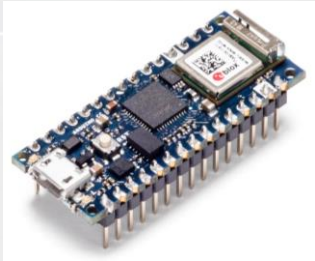
Materiel, devices: **microcontrôleurs**

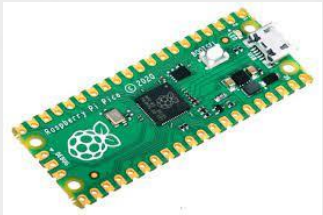
Introduction



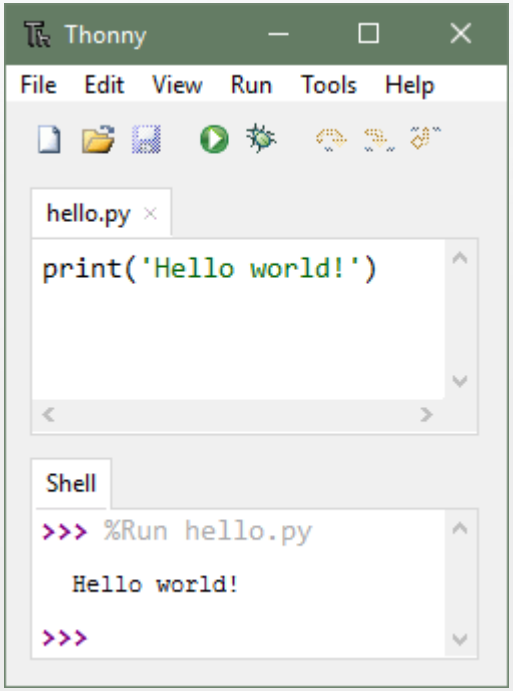


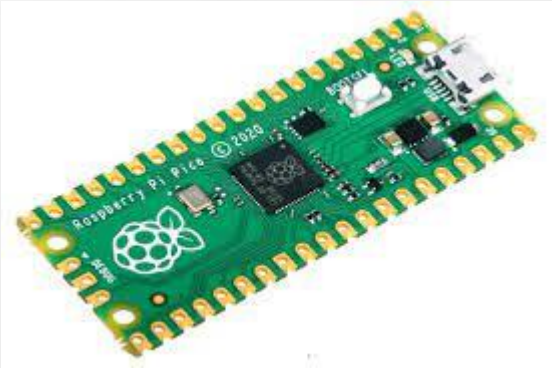


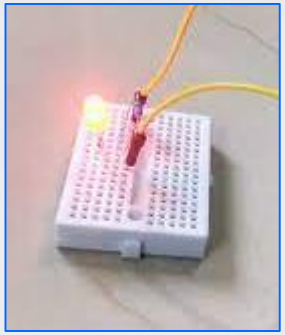




« Physical computing »



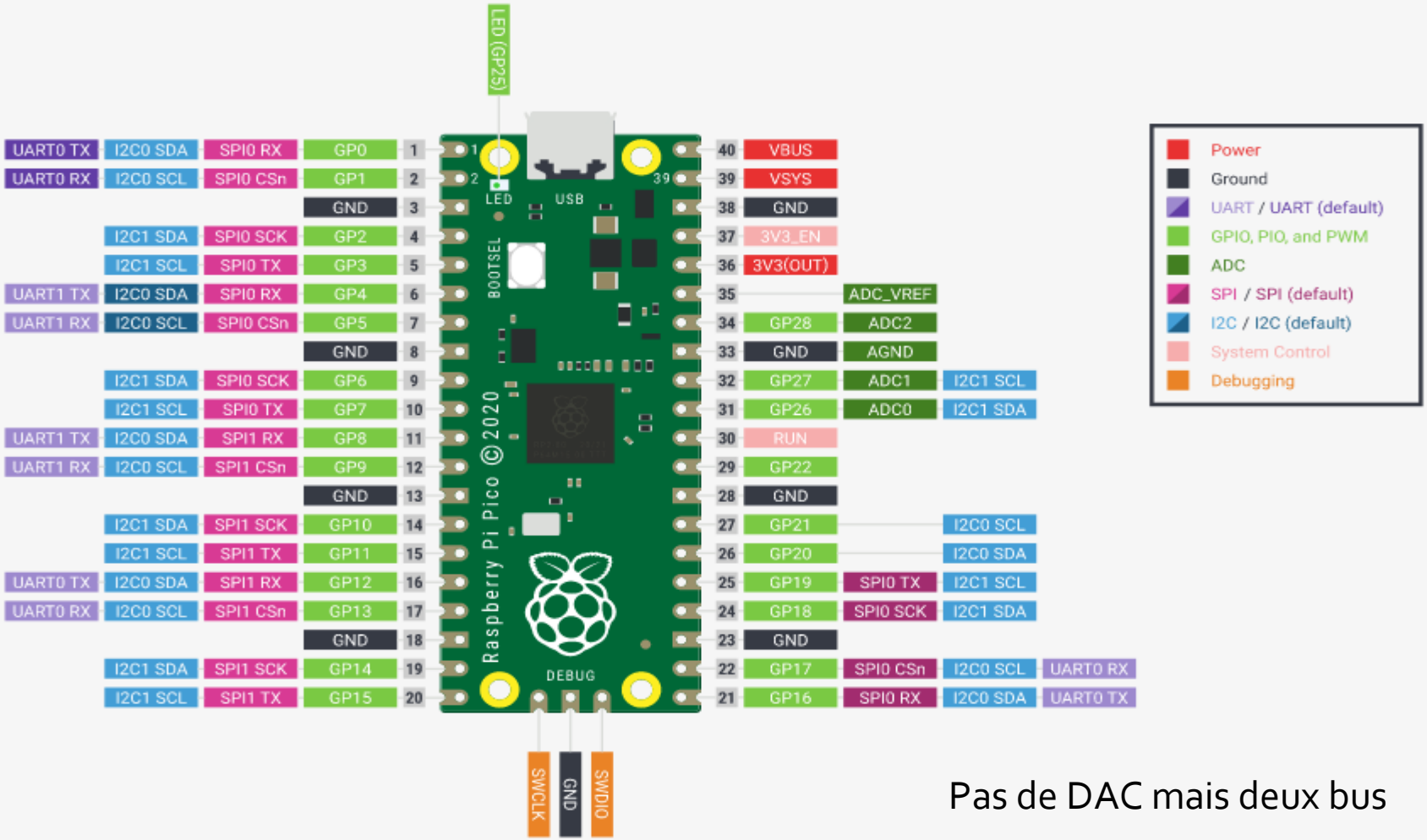




```
from machine import Pin
led = Pin(25, Pin.OUT)

led.toggle()
```

Ressources Pour interagir avec l'environnement



Pas de DAC mais deux bus

Eléments pouvant orienter les choix:

- Les ressources internes (processeurs, bus, liaison série, ADC, DAC,…)

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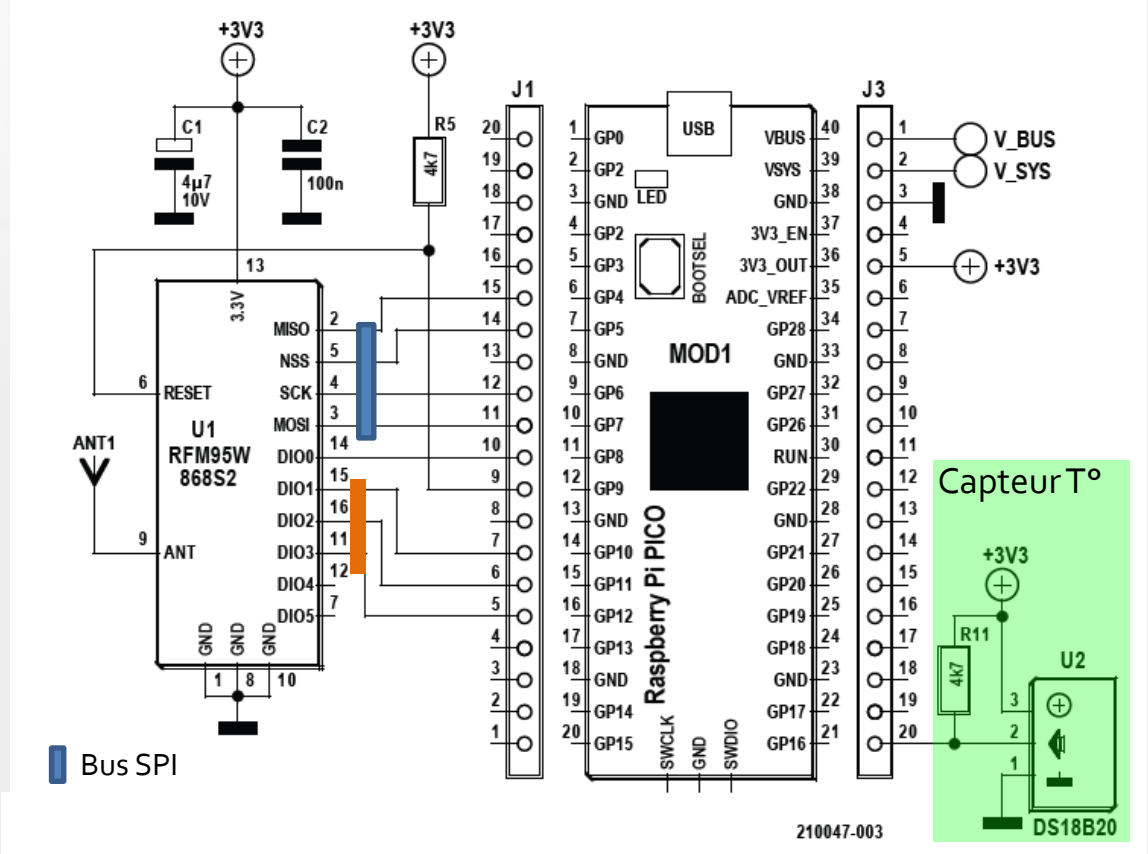
- Les niveaux des tensions d'alimentation (facilités chargeur L par ex)

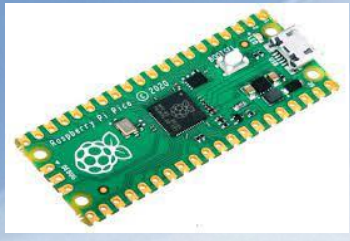
+

Device connecté - 1 raspi pico + LoRa RFM95



- Connection d'une instrumentation existante

- *Enseignement*

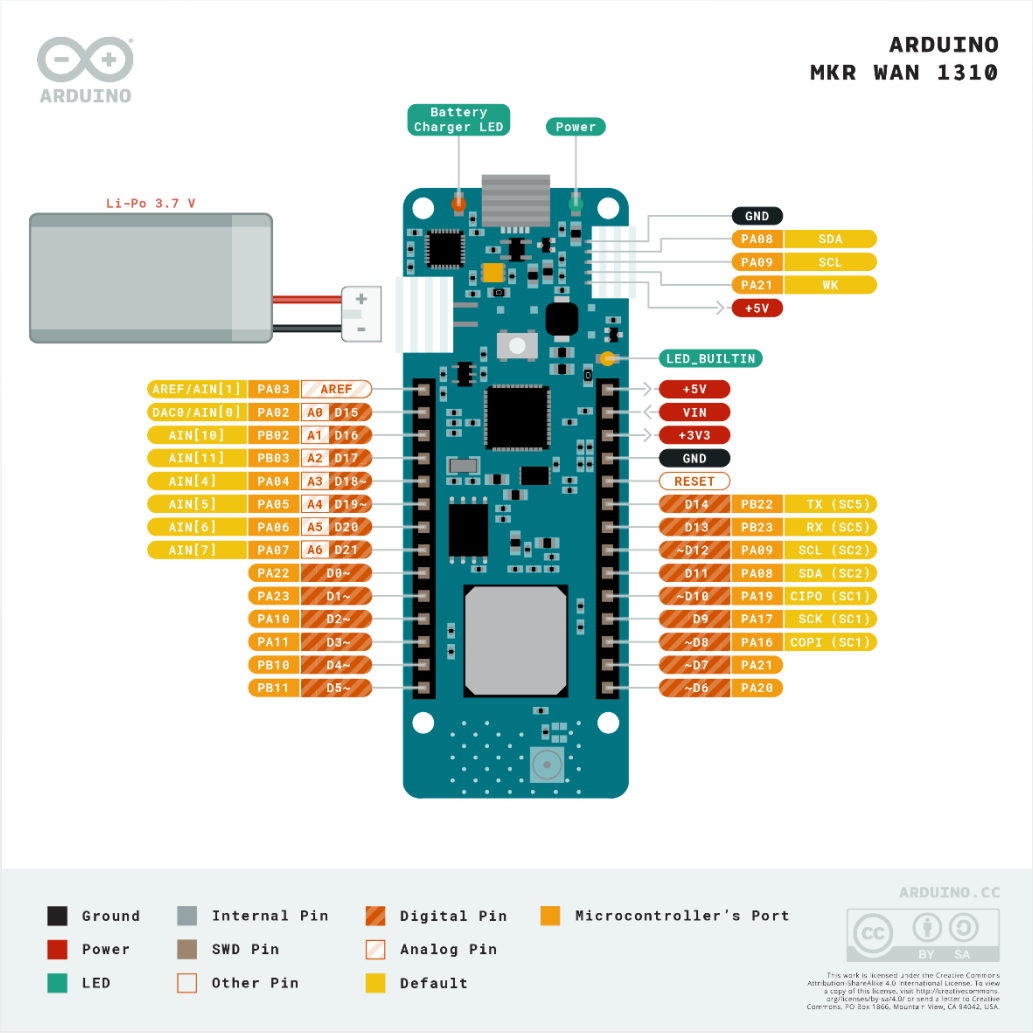


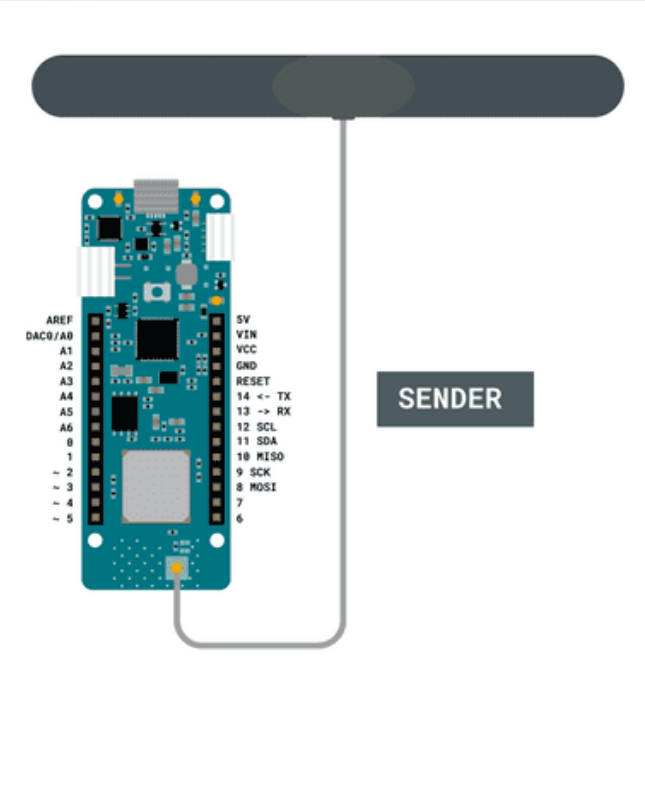
Device connecté -1. raspi pico + RFM95

Raspberry Pi Pico is a low-cost, high-performance microcontroller board with flexible digital interfaces. Key features include:

- RP2040 microcontroller chip designed by Raspberry Pi in the United Kingdom
- Dual-core Arm Cortex M0+ processor, flexible clock running up to 133 MHz
- 264kB of SRAM, and 2MB of on-board flash memory
- USB 1.1 with device and host support
- Low-power sleep and dormant modes
- Drag-and-drop programming using mass storage over USB
- 26 × multi-function GPIO pins
- 2 × SPI, 2 × I2C, 2 × UART, 3 × 12-bit ADC, 16 × controllable PWM channels
- Accurate clock and timer on-chip
- Temperature sensor
- Accelerated floating-point libraries on-chip
- 8 × Programmable I/O (PIO) state machines for custom peripheral support

2 Arduino MKR WAN 1310





https://docs.arduino.cc/hardware/mkr-wan-1310

LoRa® LED Control with MKR WAN 1310

Learn how to connect two boards using LoRa®, and how to control an LED remotely from another board.

IoT | LoRa® | LED

LoRa® Message Service with MKR WAN 1310

Learn how to use the Serial Monitor to send messages between two MKR WAN 1300 boards using LoRa® technology.

IoT | LoRa®

Send Data Using LoRa® with MKR WAN 1310

Learn how to setup a continuous stream of data between two devices using LoRa® technology.

IoT | LoRa®

LoRaWAN® Regional Parameters in the Arduino® MKRWAN 1310

Learn how to set up specific LoRaWAN® regional parameters in the LoRa® module of the Arduino® MKR WAN 1310 board using the Arduino MKRWAN library.

LoRaWAN® | Regional parameters | MKR WAN 1310 | MKRWAN

MKRWAN Examples

Examples for the MKRWAN library, which is used to communicate with the LoRa® module onboard the MKR WAN 1300/1310 boards.

LoRa | WAN

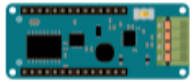
Connecting MKR WAN 1310 to The Things Network (TTN)

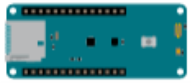
Learn how to set up an account on The Things Network (TTN) and test if your board can connect to it.

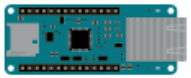
Les Shields compatibles

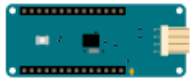
Shields

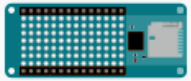

MKR 485 Shield

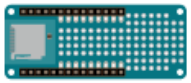

MKR CAN Shield

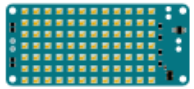

MKR ENV Shield

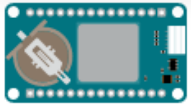

MKR ETH Shield

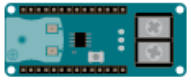

MKR IMU Shield

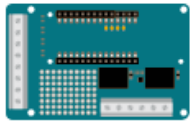

MKR MEM Shield

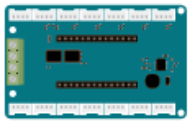

MKR SD Proto Shield


MKR RGB Shield

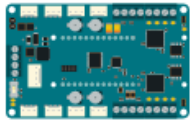

MKR GPS Shield

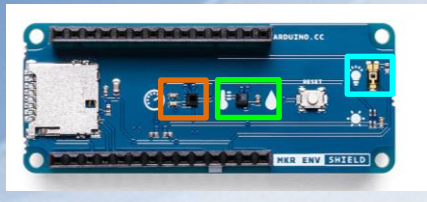

MKR Therm Shield


MKR Relay Shield


MKR Connector Carrier


MKR IoT Carrier


MKR Motor Carrier



MKR ENV shield

HTS221 Temperature & Humidity Sensor
T: -40°C -> 120°C (+/- 0,5°C)
H: 3.5% Hr -> 80% Hr
Utilisation:
readTemperature(), readTemperature(FAHRENHEIT)
readHumidity()

LPS22HB Atmospheric Pressure Sensor
P: 260 and 1260 hPa (+/-0.1 hPa dans la gamme [0%C;65°C]
readPressure(),
readPressure(param) avec param: {PSI, MILLIBAR, hectopascal,KILOPASCAL}

TEMT6000 Light Sensor
440nm – 800nm [-40°C;100°C]
readIlluminesence()
readUVA()
readUVB()
readUVIndex()
readLux()

MKR ENV shield