THE IOT LORA PROJECT

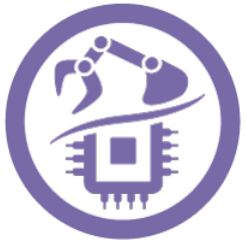
PRESENTATION

AUTHORS : PAUL LELOUP & ZAKARIA EL RHOSN

TUTOR : THIERRY GIL

2019

POLYTECH MONTPELLIER



PLAN

- Introduction
- Fonctionnalities
- Hardware
- Software
- Consumption test

Smart Sensor Devices

CONTEXTE

Industrial Project of the End of Studies

Radio communication

The French National Centre for Scientific Research (CNRS)

Internet of Things(IOT)

Smart

Sensors

23,14 billion connected devices

Laboratory of Computer Science, Robotics and Microelectronics of Montpellier(LIRMM)

Field-Programmable Gate Array (FPGA)

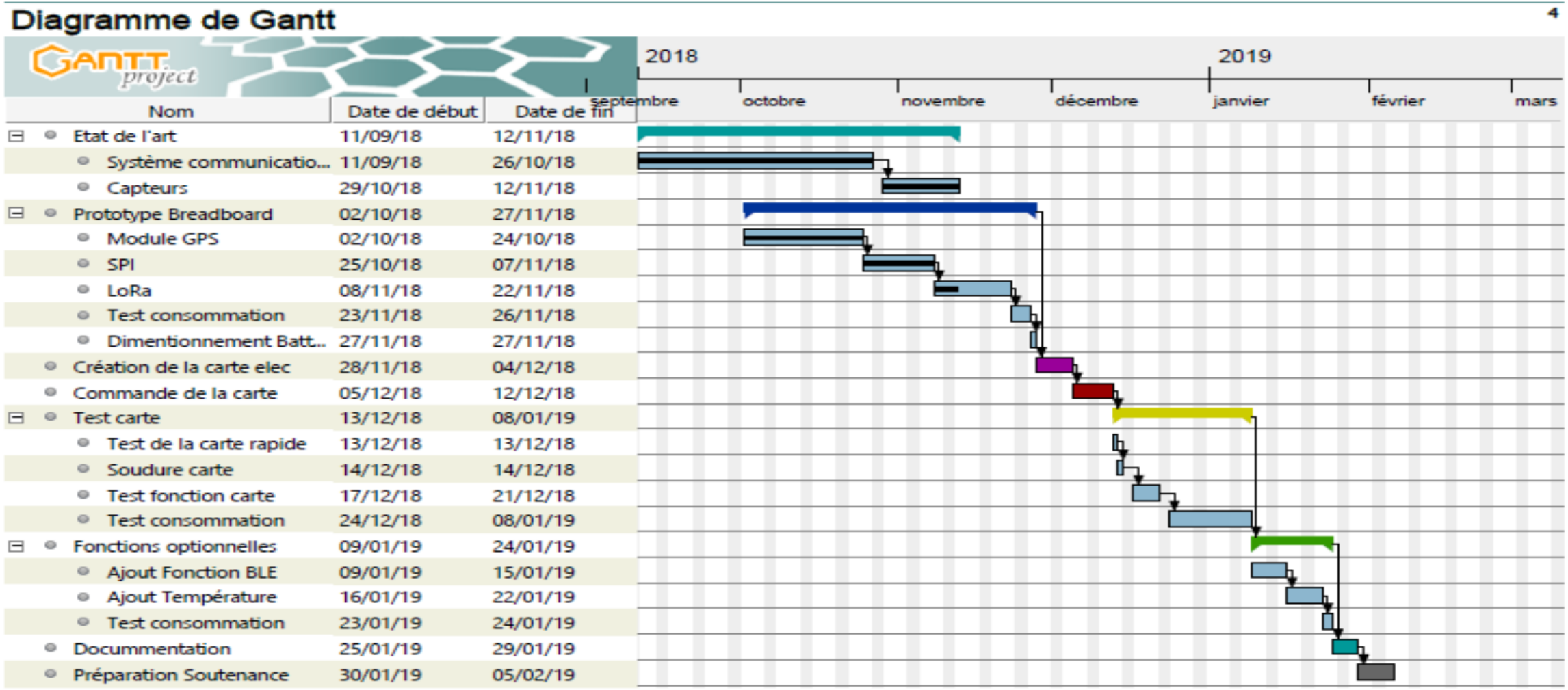
Thesis

INTRODUCTION

- Research about IoT
- Prototypes : The Smart Sensor and the Smart Gateway
- Purpose of the project: Measure the consumption and the performance of a connected device for increase it
- Differents steps…

GANTT

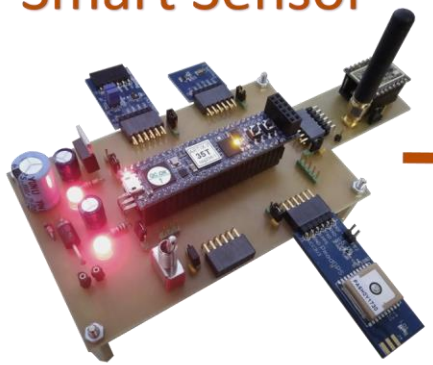
Diagramme de Gantt



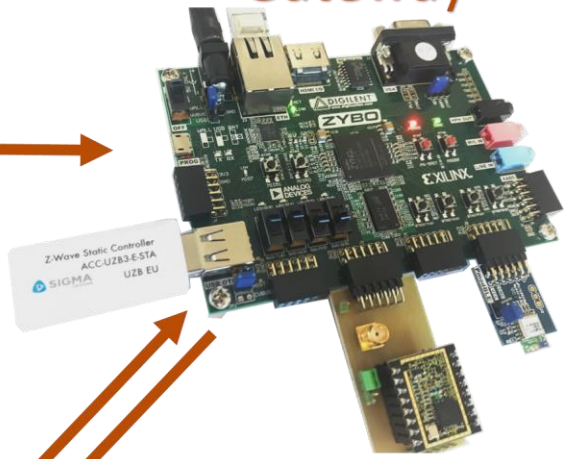
Nom	Date de début	Date de fin
Etat de l'art	11/09/18	12/11/18
Système communicatio...	11/09/18	26/10/18
Capteurs	29/10/18	12/11/18
Prototype Breadboard	02/10/18	27/11/18
Module GPS	02/10/18	24/10/18
SPI	25/10/18	07/11/18
LoRa	08/11/18	22/11/18
Test consommation	23/11/18	26/11/18
Dimentionnement Batt...	27/11/18	27/11/18
Création de la carte elec	28/11/18	04/12/18
Commande de la carte	05/12/18	12/12/18
Test carte	13/12/18	08/01/19
Test de la carte rapide	13/12/18	13/12/18
Soudure carte	14/12/18	14/12/18
Test fonction carte	17/12/18	21/12/18
Test consommation	24/12/18	08/01/19
Fonctions optionnelles	09/01/19	24/01/19
Ajout Fonction BLE	09/01/19	15/01/19
Ajout Température	16/01/19	22/01/19
Test consommation	23/01/19	24/01/19
Documentation	25/01/19	29/01/19
Préparation Soutenance	30/01/19	05/02/19

SYSTEM

Smart Sensor



Gateway



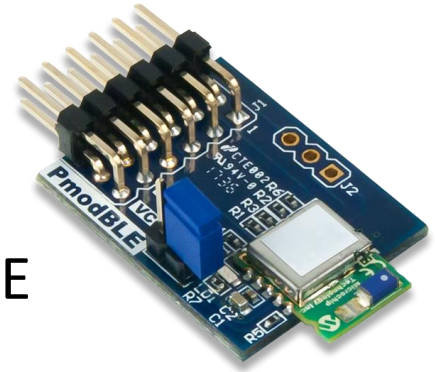
Datacenter IP

Display (Grafana)

SENSORS AND RADIOS MODULES

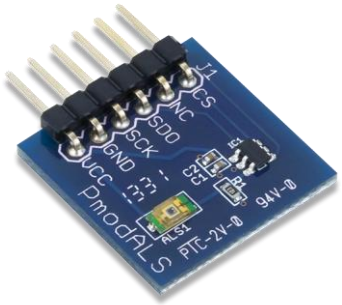
Temperature &

Humidity



BLE

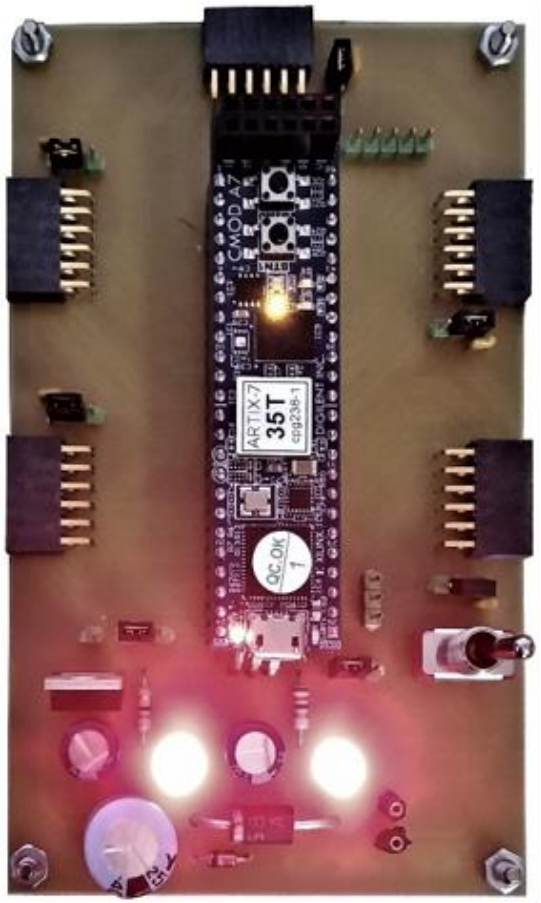
GPS

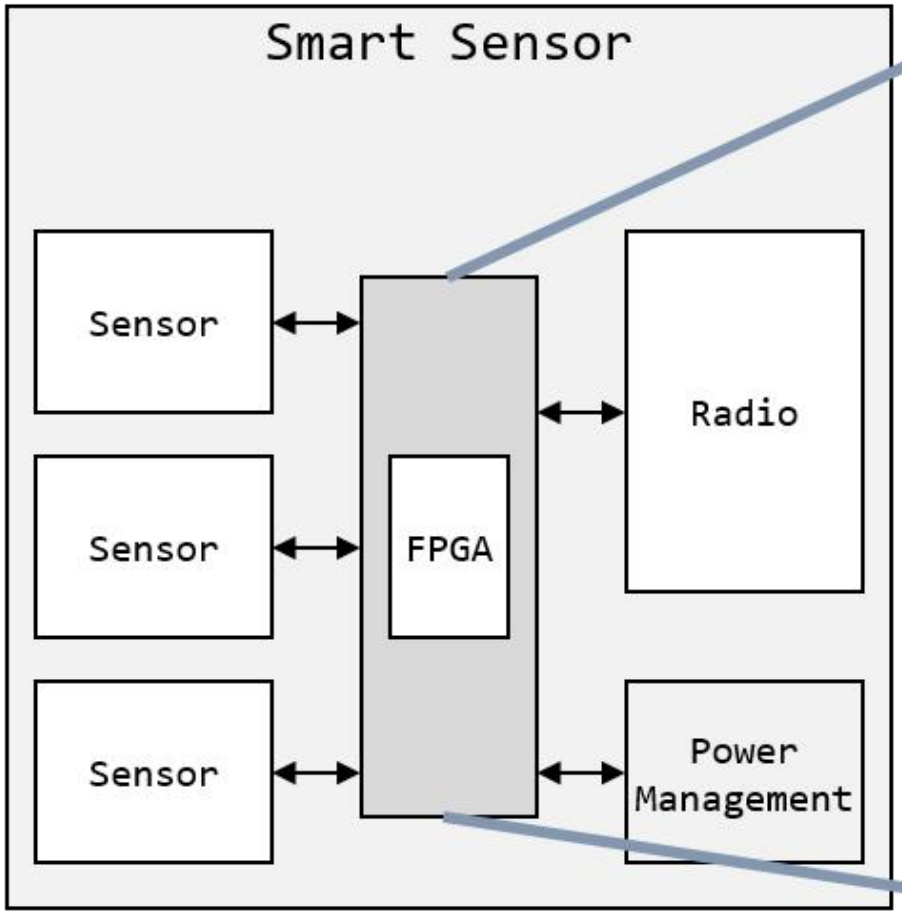


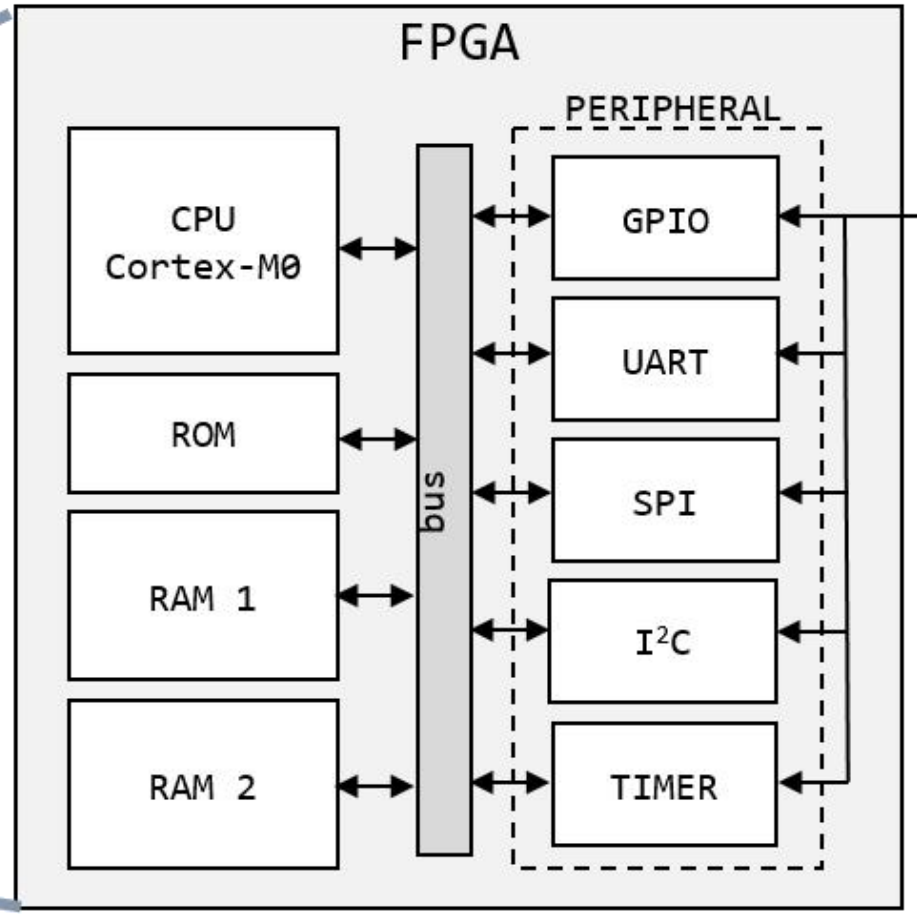
Brightness

LoRa

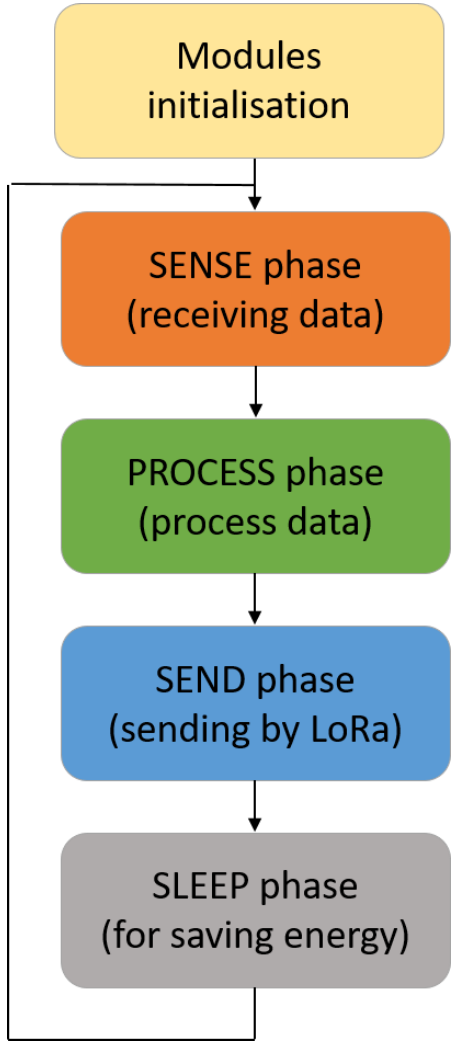
HARDWARE

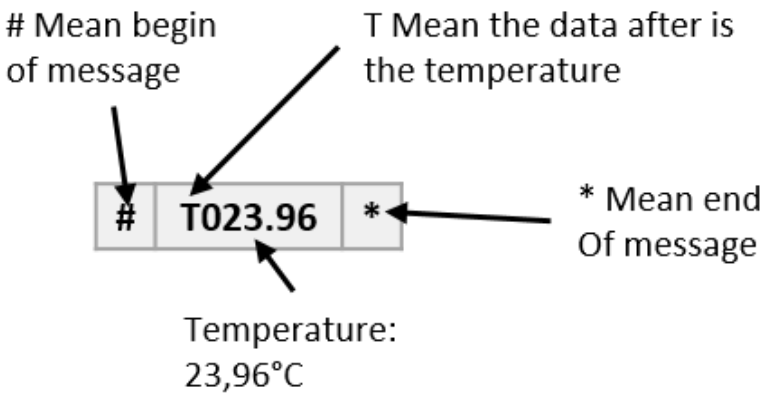



Smart Sensor
Sensor
Sensor
Sensor
FPGA
Radio
Power Management


FPGA
PERIPHERAL
CPU Cortex-M0
ROM
RAM 1
RAM 2
bus
GPIO
UART
SPI
I2C
TIMER

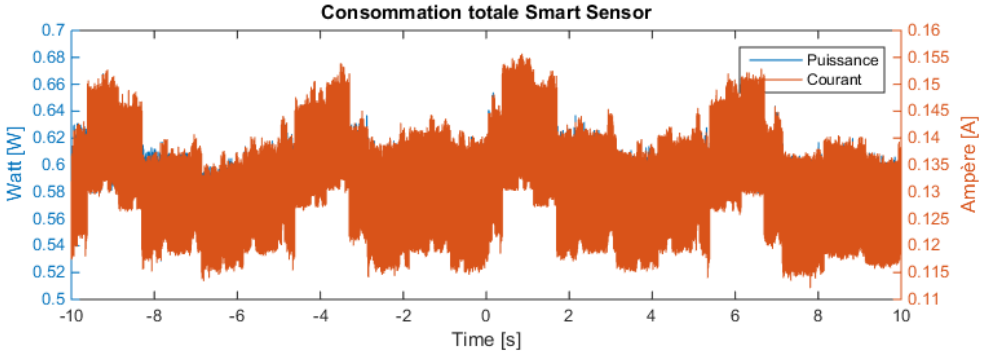
SOFTWARE

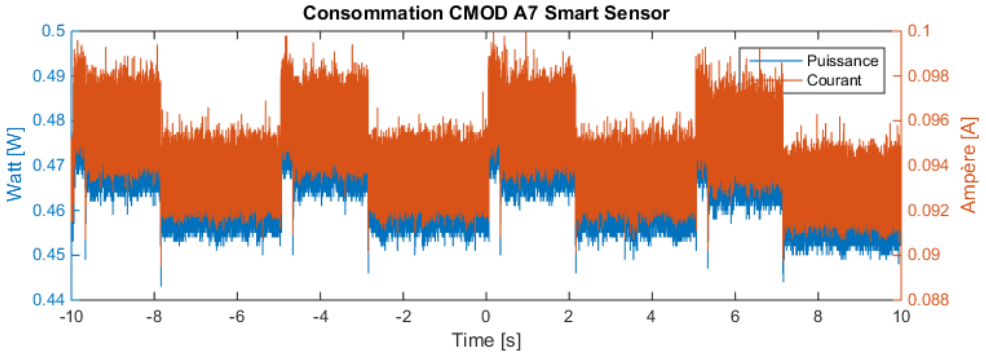


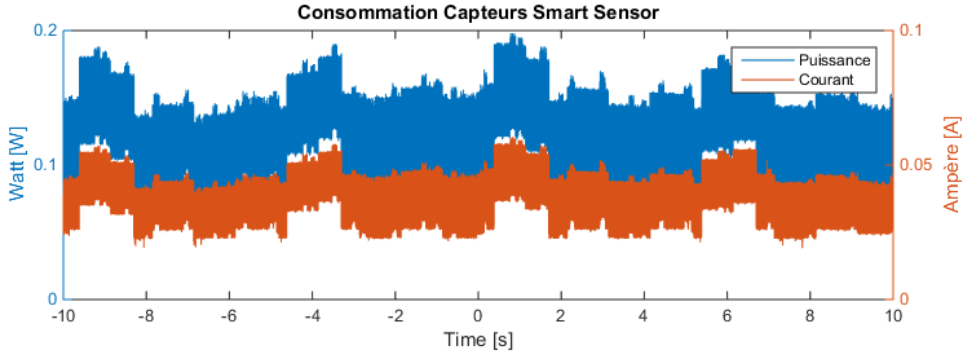


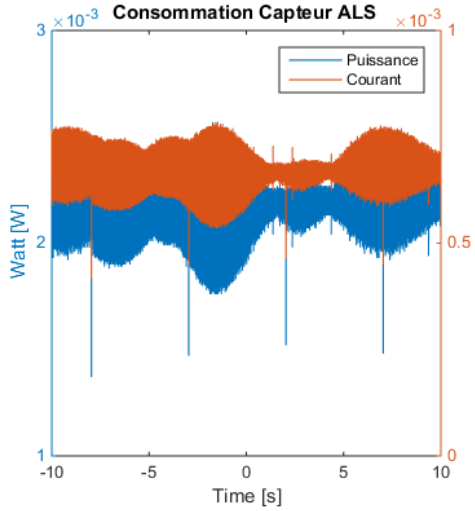

```
PHASE SEND
#H026.33,L003.13,T023.07,H082054,,,D290119*

Humidité : 026.33 %
Luminosité : 003.13 %
Température : 023.07 °C
Heure : 08:20:54
Latitude : Pas de réseau GPS
Longitude : Pas de réseau GPS
Heure : 29/01/19
```

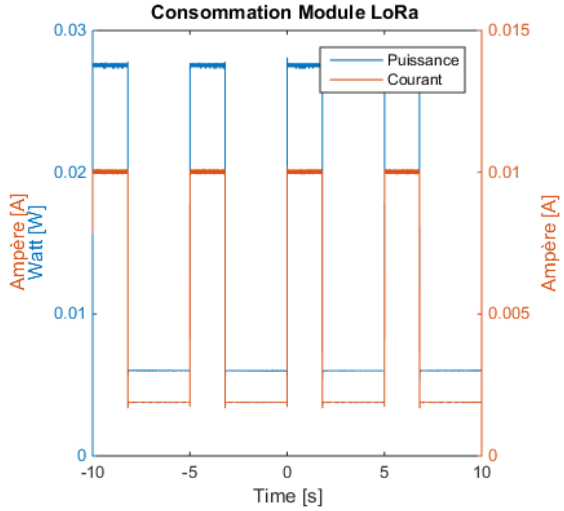
CONSUMPTION TEST

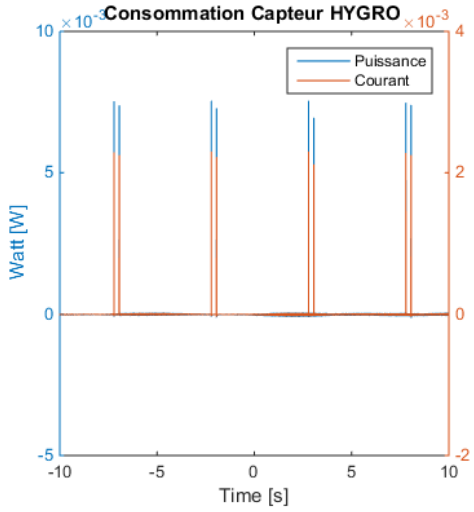


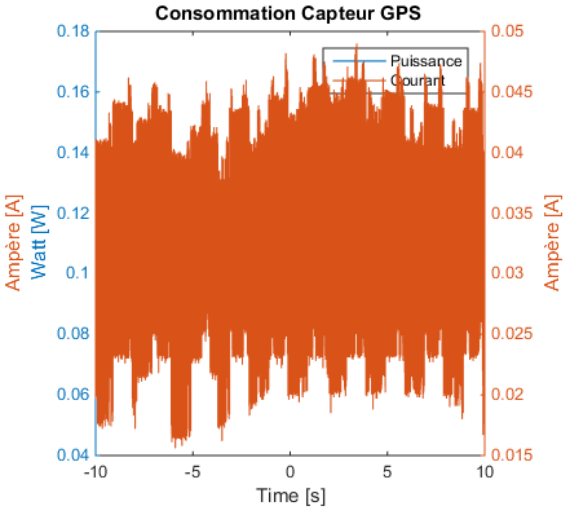












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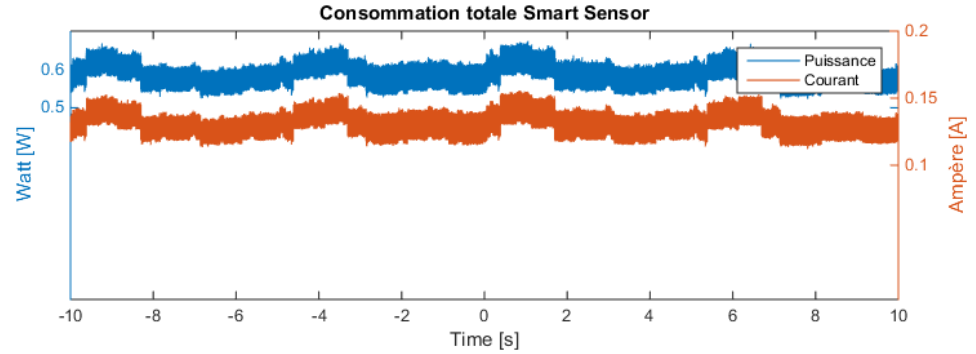

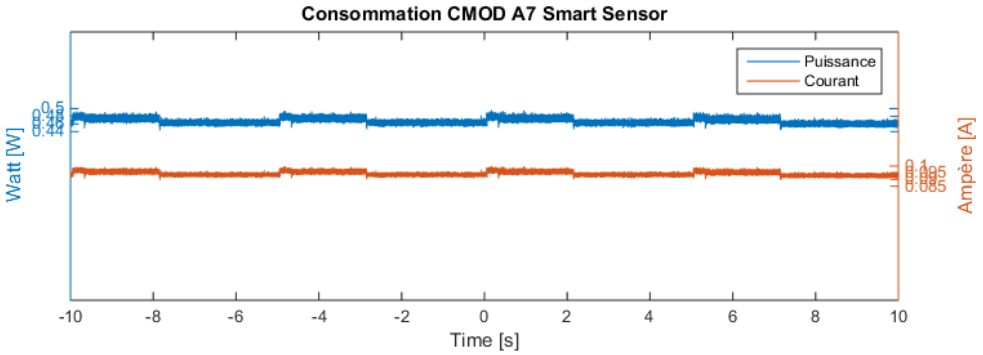

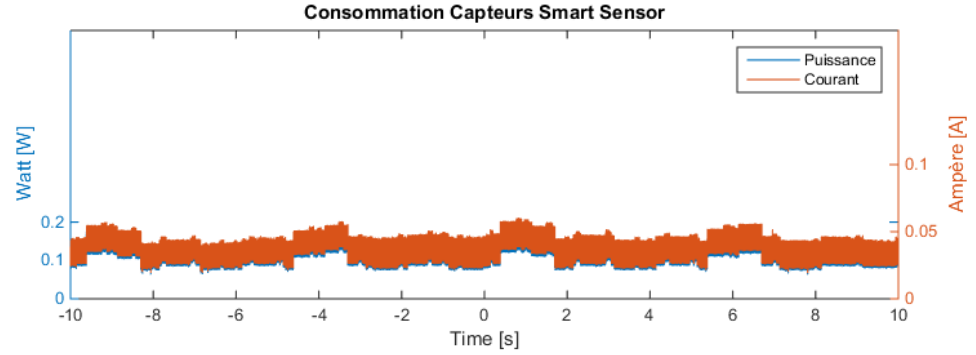

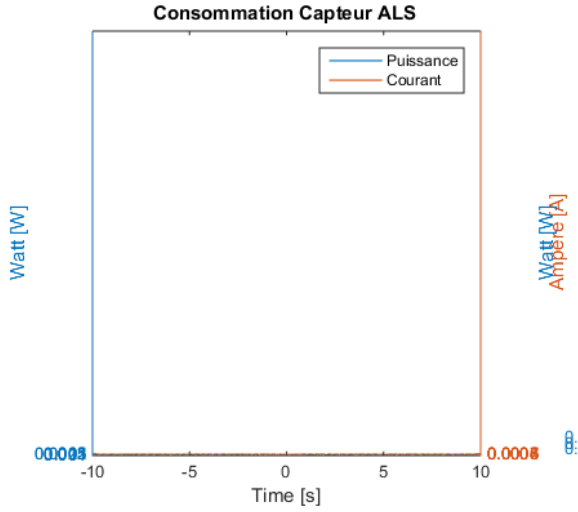

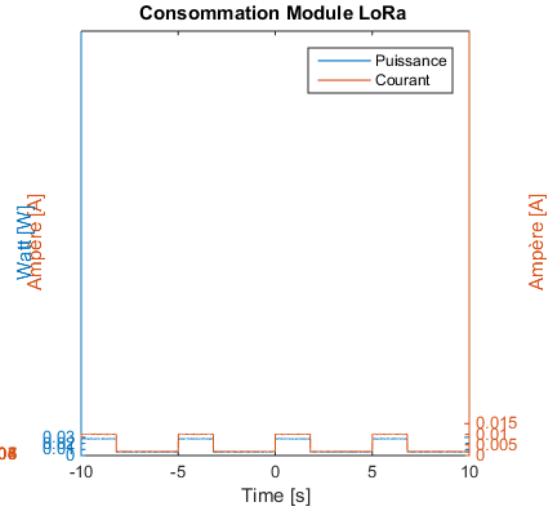

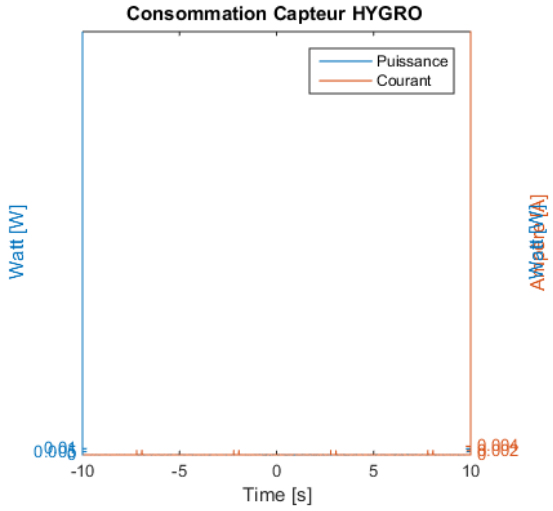

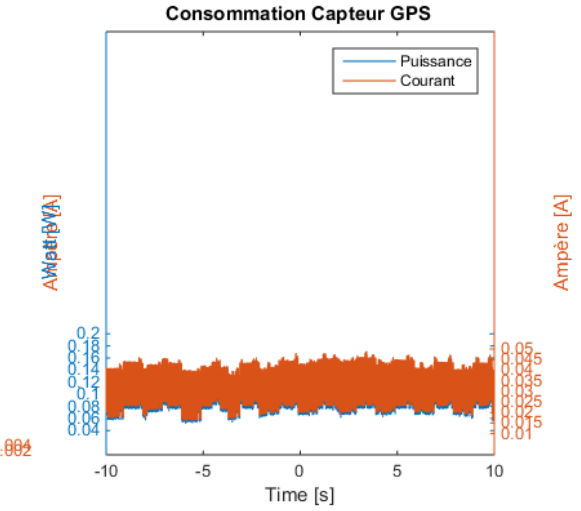

CONCLUSION