Welcome in the IOT workshop!

This document will provide you some information to set up your working environment and run a first example sketch.

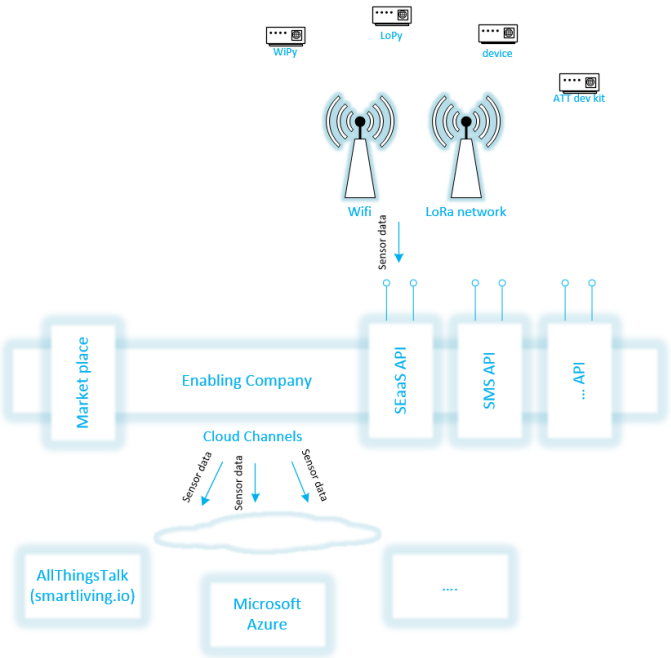
It will be divided in 3 parts:

- Create and set up your Proximus EnCo account,
- Getting started with Sodaq Mbili board,
- Running your first sketch.

First, open the Rapid Development Kit. This dev kit made by AllThingsTalk (ATT) includes different elements such as:

- A Sodaq Mbili card (based on Arduino),
- A LoRa network connection chip developed my Microchip with an antenna,
- A battery and a solar panel,
- A USB cable,
- A bunch of Groove sensors that can be easily connected to the Sodaq Mbili board.

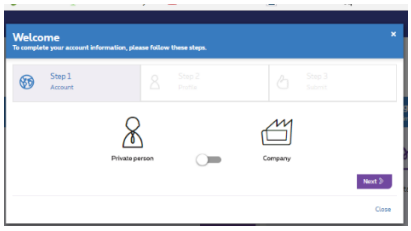
Second, take a look at the general overview of the system (source: https://docs.enco.io/docs/) :



As you can see, the ATT dev kit will be used to send the sensors data to EnCo through the LoRa network. You can see these data on the Proximus EnCo portal or send them on the ATT portal using a Cloud Channel.

Create your Proximus EnCo account

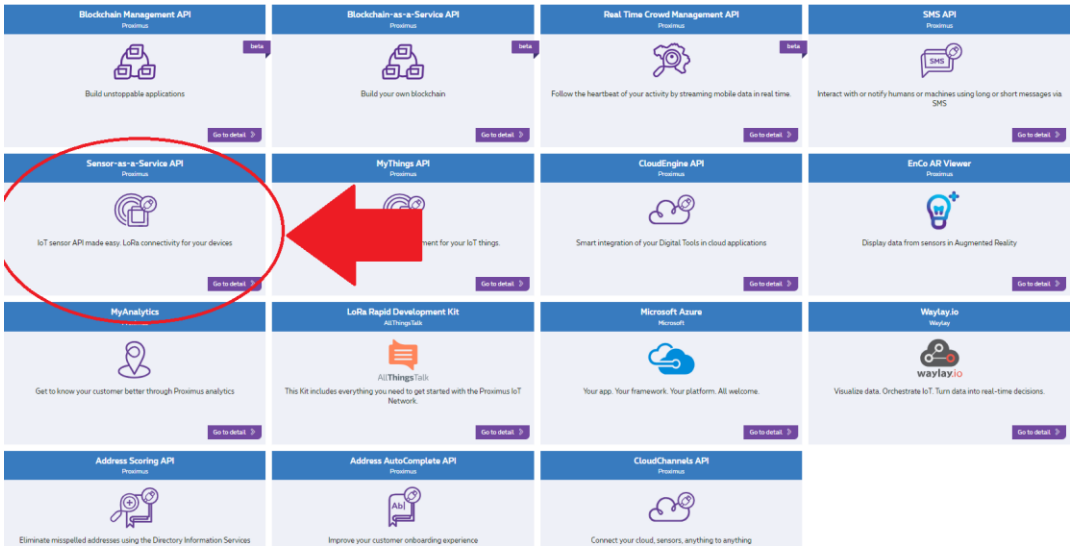
Go to https://www.enco.io/ and **register using one of your EPHEC student group member credentials**. Validate your account using the mail you received, and you can skip the profile information pop-up.



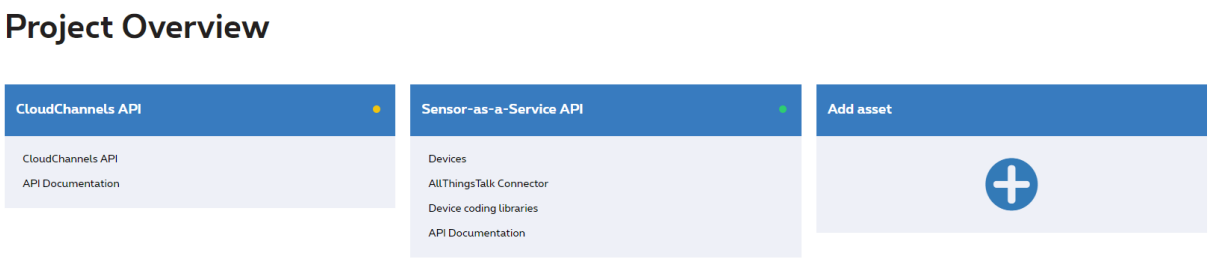
On the left side of the screen, click on DEVPORTAL to see the Project Overview.

You already have CloudChannels API in your project (you might have to refresh the page to see it). It will allow you to transfer the data to the ATT platform (or other).

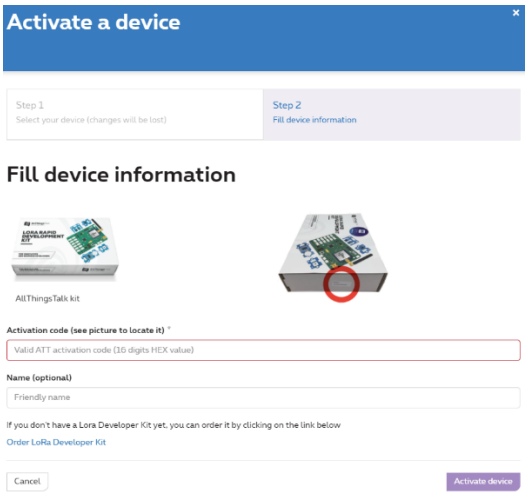
Click on “Add Asset” and in the “Asset Overview” page, choose the “Sensor-as-a-Service API”.



Click on the « Activate » Button and subscribe to the « Welcome Plan ». When you go back on the DevPortal page, you should see this:



Click on the « Devices » link in the SaaS API frame and then click on « Activate Device ».
Choose the ATT Kit and fill the « Activation code » field with the number (DEVEUI) provided with your dev kit.



Your kit should now be able to connect to the LoRa network.

In the DevPortal, check the devices, select your kit in the list, and make sure it has the following sensors defined. If not, create these sensors.

Sensors Create a sensor API

Sensor Name	Sensor Type	Sensor Value			
HumiditySensor	Lora_container	/	Reset Data	Delete	Edit Output
IntegerSensor	Lora_container	/	Reset Data	Delete	Edit Output
LightSensor	Lora_container	/	Reset Data	Delete	Edit Output
PressureSensor	Lora_container	/	Reset Data	Delete	Edit Output
TemperatureSensor	Lora_container	/	Reset Data	Delete	Edit Output

Also notice the « Keys » panel. You have here all the keys you'll use to connect your Sodaq Mbili board on the LoRa network and on the ATT platform.

Getting started with Sodaq Mbili board

Install the Arduino IDE: https://www.arduino.cc/en/Main/Software

Install now the SODAQ Mbili board support in your Arduino IDE: follow the steps 2 to 5 from this tutorial: http://support.sodaq.com/mbili/

Install ATT SDK in Arduino IDE:

- Download zip file from http://docs.allthingstalk.com/developers/sdk/arduino-lorawan/
- Under Sketch > Include library > Add .ZIP library and select the "arduino-lorawan-sdk-master" file

Install ATT RDK in Arduino IDE:

- Download https://github.com/allthingstalk/arduino-lorawan-rdk/archive/master.zip
- Install this RDK in Arduino IDE following the same procedure as for SDK

Please take a look at this page to see the grove connectors available on your SODAQ Mbili board: http://support.sodaq.com/grove/

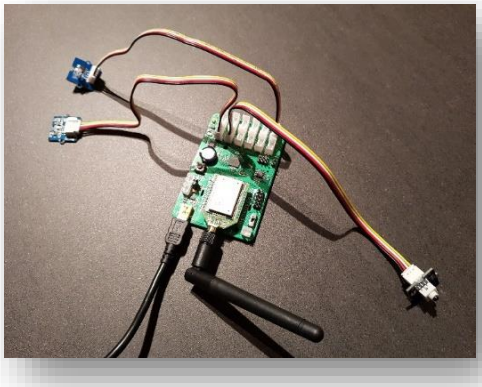
It is time now to run your first sketch!

The ATT website provides few examples including an environmental sensing sketch, BUT we won't use it just like that.
Why?
Because, by default, the environmental-sensing sketch in the ATT RDK examples is configured to send messages every 5 minutes, and this for each sensor (T°, humidity, pressure, humidity, sound, air quality), which would result in your data plan to be quickly consumed.
Your SEaaS Welcome Plan allows your device to send 24 messages per day. All subsequent messages will be discarded by the network.
For this introduction workshop, we have reduced in the sketch the number of sensors connected to the board to 3 (light, T° and Humidity), and we will use the pushbutton as a trigger to send the messages.

Prepare your board for this first sketch (check: http://support.sodaq.com/grove/)

- Attach LoRa™ module & antenna
- Connect the light sensor to A2/A3
- Connect the TPH sensor (Temperature Pressure Humidity) to SCL/SDA (I^2C socket)
- Connect the push button to D20/D21

Your board should look like this:

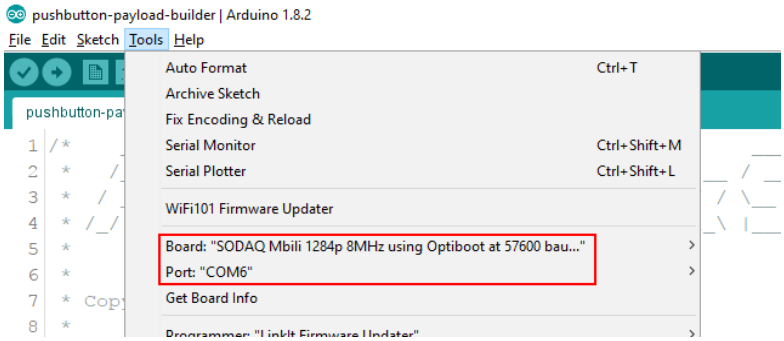


Connect the kit to your computer over USB and check that the ATT kit's power switch is « on ».
Notice that the serial communication between the kit and your computer might need the installation of FTDI drivers. If needed, take a look here http://www.ftdichip.com/FTDrivers.htm

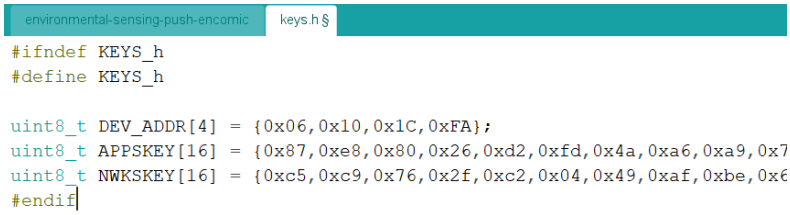
Download the sketch from the International Week course in the **EPHEC** online course platform (the **EPHEC** students of your group can access that!) The name is « *environmental-sensing-push-encomic.rar* ».
Unzip the file on your local drive. Ensure both *.ino* and *.h* files are in the same directory.

Open the *.ino* file in the Arduino IDE and follow the next steps:
In the Arduino IDE:

- Go to Tools > Board: and select the SODAQ Mbili board
- Under Tools > Port: select the USB port to which your device is connected



- It's time now to add the LoRaWAN keys of your device (dev_addr, apps key and nwkskey) to your example sketch, so it knows where to send its data. You can find them in the EnCo DEVPORTAL, in the SEaaS asset, in your device details (keys). Fill in your keys in the *keys.h* file as shown below



Compile the Arduino sketch and check for any error (there shouldn't be any, unless you did not import both ATT SDK and RDK files correctly).
Transfer the compiled sketch to your board and open the Serial Monitor (CTRL-Shift-M). Check that the speed setting on the serial monitor is correctly set to 57600.
As the compiled sketch is transferred, you should see your board come alive and initialize. The board will not send any messages unless you press the button. Don't press too often as you only have 24 messages a day!!