

nanogateway lopy4 add node OTAA

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1 Introduction

But : Connecter un device à The Things Network par la méthode Over The Air Activation.

Prérequis : utiliser The Things Network cf tuto *nanogateway_loy4_lorawan*

Carte : pycom lopy 4 avec expansion board V3.0



Figure 1: pycom lopy 4

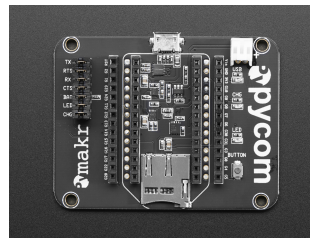


Figure 2: expansion board v3.0



Figure 3: antenne LoRa

2 Matériel

Branchez l'antenne LoRa avant d'alimenter la carte sinon la carte grille

3 Code pour Over The Air Activation

Le code se trouve à : https://github.com/GitClementtest/node_otaa

Informations complémentaires : <https://docs.pycom.io/tutorials/lora/lorawan-nano-gateway/>

3.1 Over The Air Activation

Téléchargez le code suivant sur une carte lopy4+pymakr+antenne :

```
""" OTAA Node example compatible with the LoPy Nano Gateway """

from network import LoRa
import socket
import ubinascii
import struct
import time

# Initialize LoRa in LORAWAN mode.
lora = LoRa(mode=LoRa.LORAWAN, region=LoRa.EU868)

# create an OTA authentication params
dev_eui = ubinascii.unhexlify('1111111111111111') # these settings can be found from TTN
app_eui = ubinascii.unhexlify('70B3D57ED00210CD') # these settings can be found from TTN
app_key = ubinascii.unhexlify('6C5401A22F121D96BBF13CF4B1871795') # these settings can
#be found from TTN

# set the 3 default channels to the same frequency (must be before sending the OTAA
#join request)
lora.add_channel(0, frequency=868100000, dr_min=0, dr_max=5)
lora.add_channel(1, frequency=868100000, dr_min=0, dr_max=5)
lora.add_channel(2, frequency=868100000, dr_min=0, dr_max=5)

# join a network using OTAA
lora.join(activation=LoRa.OTAA, auth=(dev_eui, app_eui, app_key), timeout=0)

# wait until the module has joined the network
while not lora.has_joined():
    time.sleep(2.5)
    print('Not joined yet...')

# remove all the non-default channels
for i in range(3, 16):
    lora.remove_channel(i)

# create a LoRa socket
s = socket.socket(socket.AF_LORA, socket.SOCK_RAW)
```

```

# set the LoRaWAN data rate
s.setsockopt(socket.SOL_LORA, socket.SO_DR, 5)

# make the socket non-blocking
s.setblocking(False)

time.sleep(5.0)

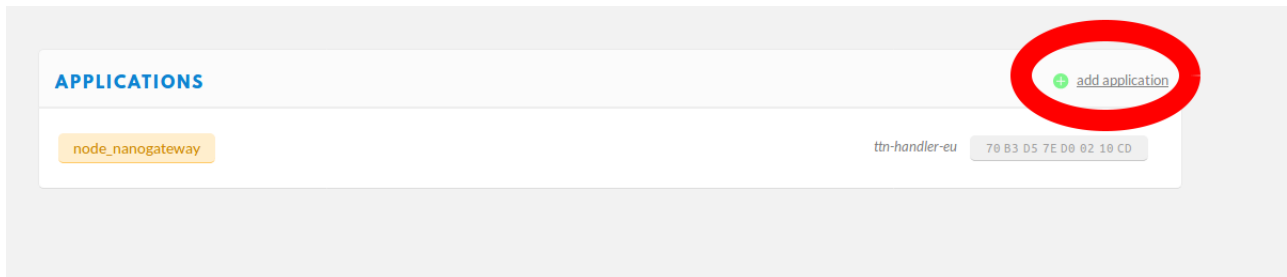
""" Your own code can be written below! """

for i in range(200):
    s.send(b'PKT #' + bytes([i]))
    time.sleep(4)
    rx = s.recv(256)
    if rx:
        print(rx)
    time.sleep(6)

```

3.2 Créer une application sur The Thing Network

- Créez une application Depuis *Console* sélectionner application, puis ajoutez une application :



Donnez un nom pour l'application ID :

ADD APPLICATION

Application ID
The unique identifier of your application on the network

test

Description
A human readable description of your new app

Eg. My sensor network application

Application EUI
An application EUI will be issued for The Things Network block for convenience, you can add your own in the application settings page.

EUI issued by The Things Network

Handler registration
Select the handler you want to register this application to

ttn-handler-eu

3.3 Ajouter un device dans l'application

Overview **Devices** Payload Formats Integrations Data Settings

APPLICATION OVERVIEW

Application ID testtsdlfkdm [documentation](#)

Description

Created 3 minutes ago

Handler ttn-handler-eu (current handler)

APPLICATION EUIs [manage euis](#)

Puis *register device*

Choisir un nom pour le device ID et 16 caractères hexadécimaux pour l'EUI.

REGISTER DEVICE
[bulk import devices](#)

Device ID
This is the unique identifier for the device in this app. The device ID will be immutable.

device_ex

Device EUI
The device EUI is the unique identifier for this device on the network. You can change the EUI later.

55 55 55 55 55 55 55 55
8 bytes

App Key
The App Key will be used to secure the communication between you device and the network.

this field will be generated

App EUI

70 B3 D5 7E D0 02 10 FF

Copiez les valeurs de Device EUI, APP Key et App EUI dans main.py

Vérifier que OTAA est la méthode d'activation

DEVICE OVERVIEW

Application ID testtsdlfkim

Device ID device_ex123456

Activation Method OTAA

Device EUI 55 55 55 55 55 55 55 55

Application EUI 70 B3 D5 7E D0 02 10 FF

App Key

Status ● never seen

Frames up 0 [reset frame counters](#)

Frames down 0

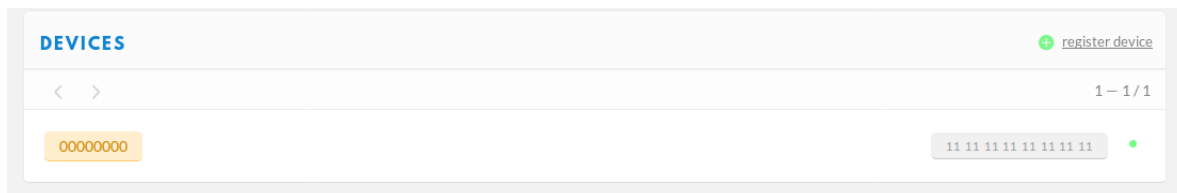
Téléchargez le code sur la carte avec Atom.

3.4 Lire la payload envoyée par le device

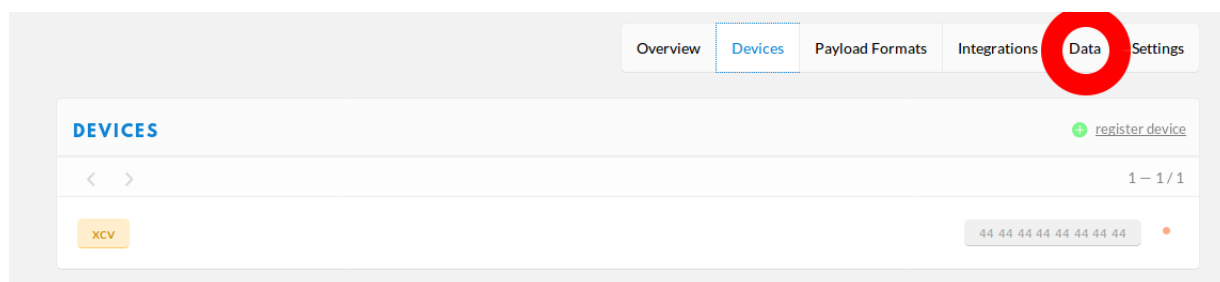
- Une fois le device connecté :

```
clk_drv:0x00,q_drv:0x00,d_drv:0x00,cs0_drv:0x00,hd_drv:0x00,wp_drv:0x00
mode:DIO, clock div:1
load:0x3fff8028,len:8
load:0x3fff8030,len:1728
load:0x4009fa00,len:0
load:0x4009fa00,len:14612
entry 0x400a059c
Not joined yet...
Not joined yet...
Not joined yet...
```

Figure 4: Atom



- Dans l'onglet data :



APPLICATION DATA

Filters

uplink

downlink

activation

ack

error

	time	counter	port		
▲	16:22:34	11	2	dev id: 00000000	payload: 50 4B 54 20 23 0B
▲	16:22:24	10	2	dev id: 00000000	payload: 50 4B 54 20 23 0A
▲	16:22:14	9	2	dev id: 00000000	payload: 50 4B 54 20 23 09
▲	16:22:04	8	2	dev id: 00000000	payload: 50 4B 54 20 23 08
▲	16:21:54	7	2	dev id: 00000000	payload: 50 4B 54 20 23 07