

# **Get Start with RAK7246**

## **RPi LoRa Gateway**

Version V1.0 | Jan 2020

**[www.RAKwireless.com](http://www.RAKwireless.com)**

*Visit our website for more document.*

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# 1. Overview

This document can be used for RAK7246 which is built by using RPi zero W and RAK2246 Pi HAT.



Please have a look at RAK website for more details:

<https://downloads.rakwireless.com/en/LoRa/NeoPi-Gateway-RAK7246/>

## 2. What do you need to prepare?

RAK7246;

You can buy them from RAK online store:

<https://store.rakwireless.com/>

A 16G SD card, a card reader, and a PC;

Install a writing software on the PC which can be used to burn firmware into SD card, for example, you can use Etcher, which can be download freely from here:

<https://www.balena.io/etcher/>

Install a SSH tool on the PC if the OS of the PC is Windows. You can use Putty, which can be download freely from here:

<https://www.chiark.greenend.org.uk/~sgtatham/putty/latest.html>

If the OS of the PC is Linux or Mac OS, there is a built-in SSH tool already.

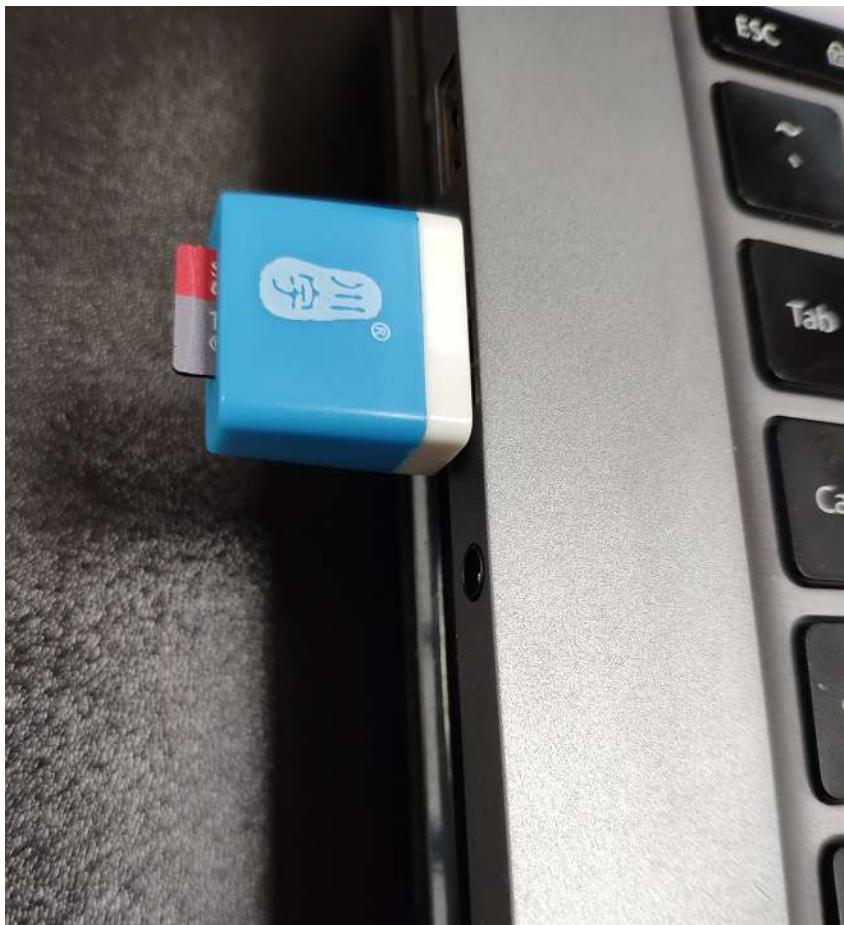
Download the latest firmware from RAK website:

<https://downloads.rakwireless.com/en/LoRa/NeoPi-Gateway-RAK7246/Firmware/>

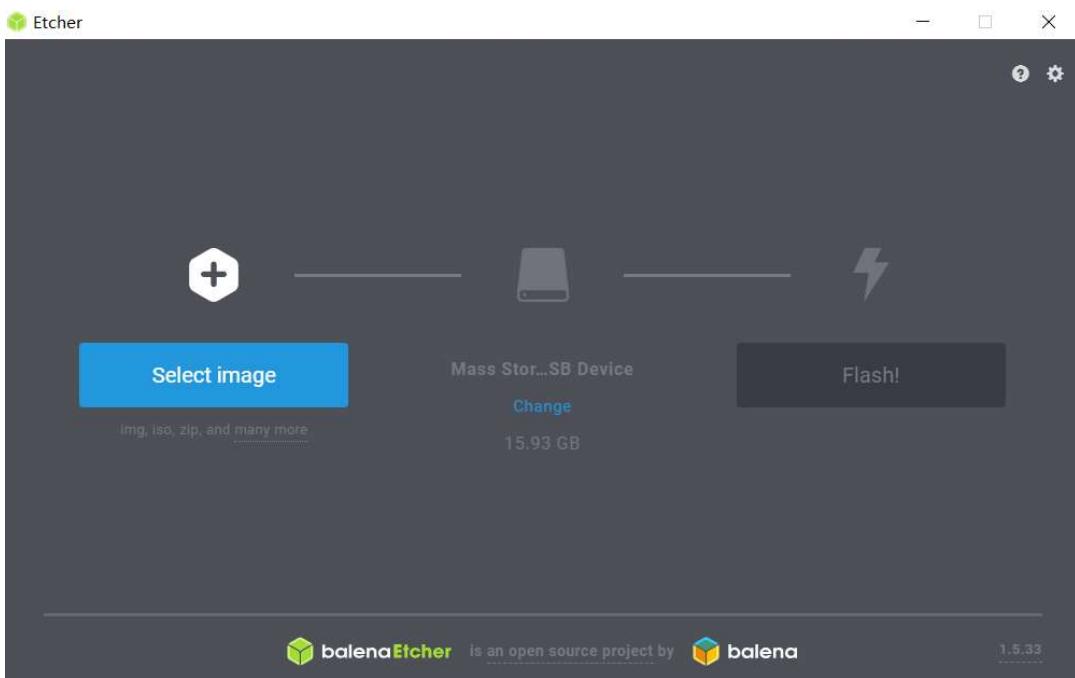
## 3. Burn the latest firmware for RAK7246

Note: If your RAK7246 has the latest firmware image in the SD card, you can skip this section.

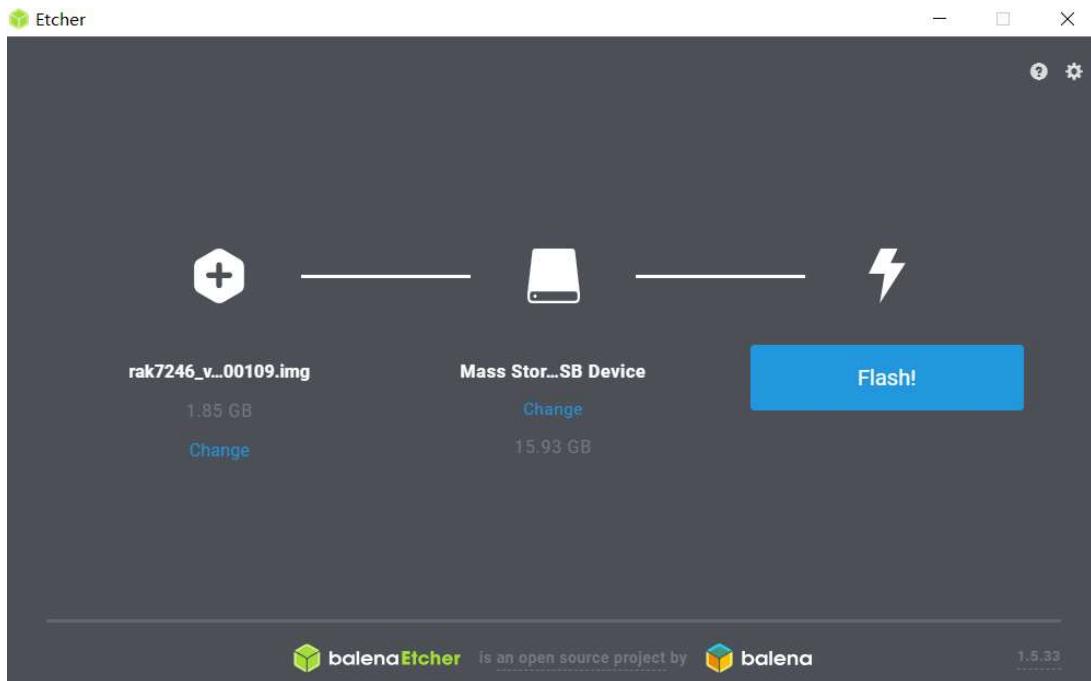
Firstly, insert SD card into the card reader and insert the card reader into your PC:



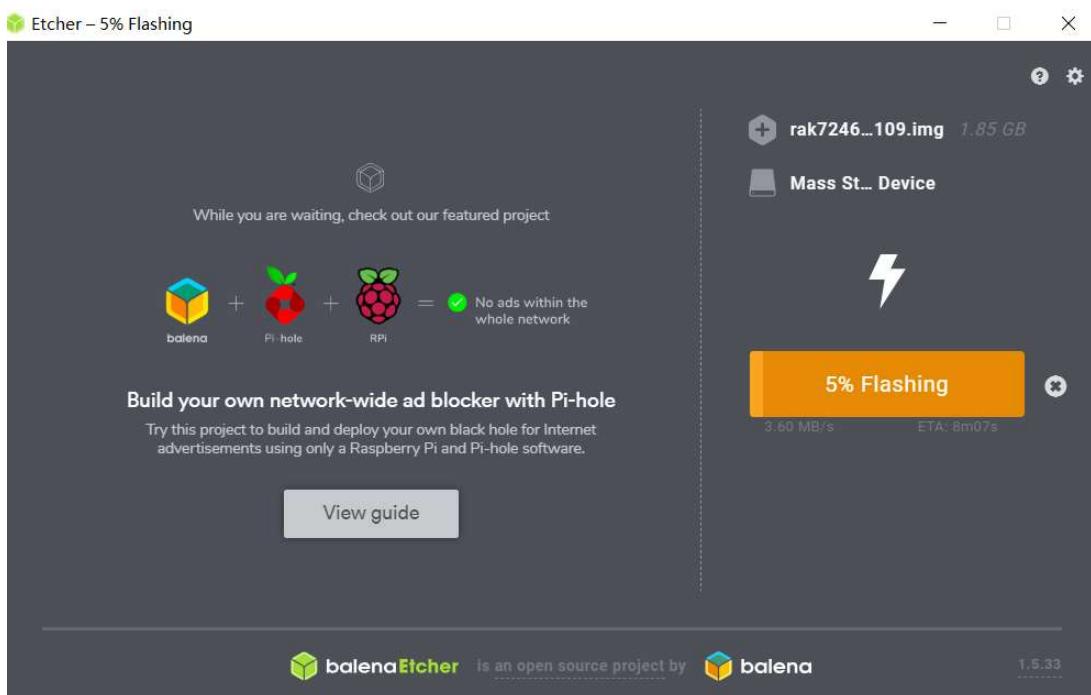
Secondly, open the Etcher software in your PC:



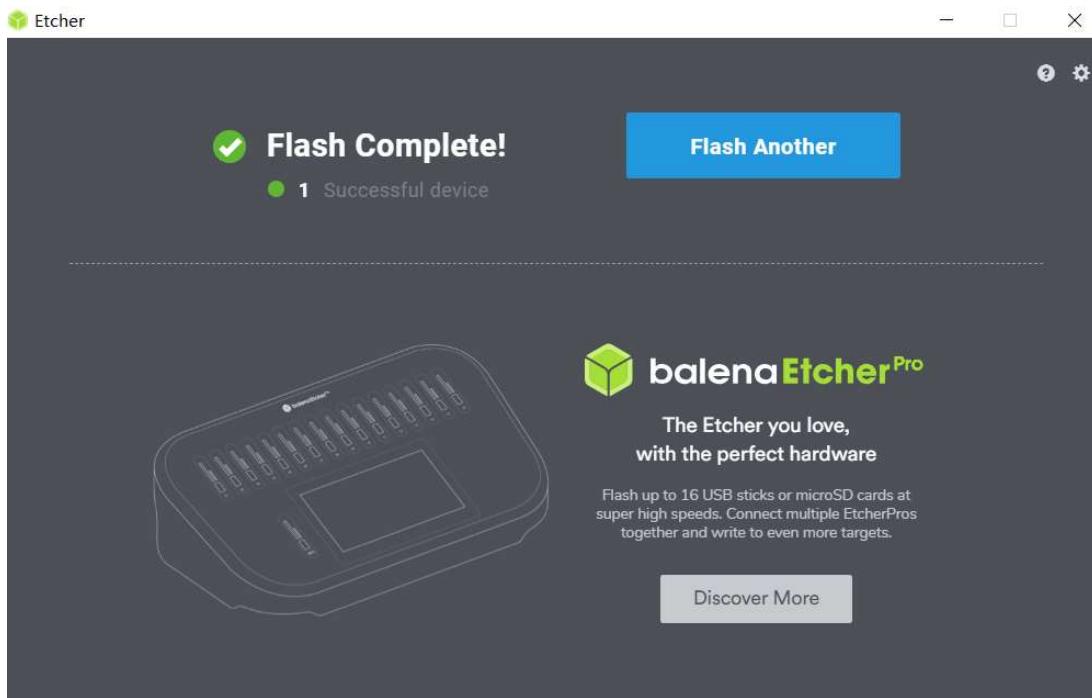
“Select image”:



Start to “Flash”:



Just wait for several minutes, it will be done automatically:



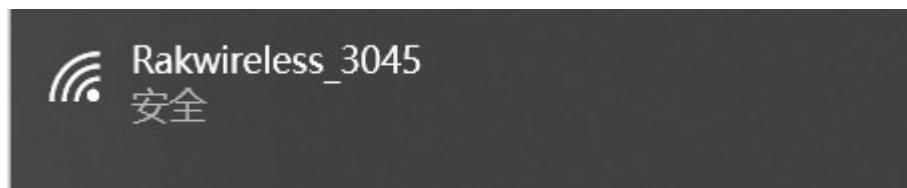
Now, close the software and insert the SD card into RAK7246.

Finally, power on RAK7246.

## 4. Connect your PC with RAK7246

For RAK7246, you can only connect your PC with it through WiFi because RAK7246 uses RPi zero W which has only WiFi:

The first time you use RAK7246, the WiFi works in AP mode which means that you can connect your PC with RAK7246 through WiFi. Just open your PC's WiFi and you can find a SSID named like "Rakwireless\_XXXX" on your PC Wi-Fi network list, for example:



Note: "XXXX" is the last 2 bytes of your RAK7246's WiFi MAC address.

You can connect this Wi-Fi SSID by using "rakwireless" as the default password. The default IP address of the LoRa gateway's Wi-Fi is 192.168.230.1, and your PC will obtain an IP address automatically;

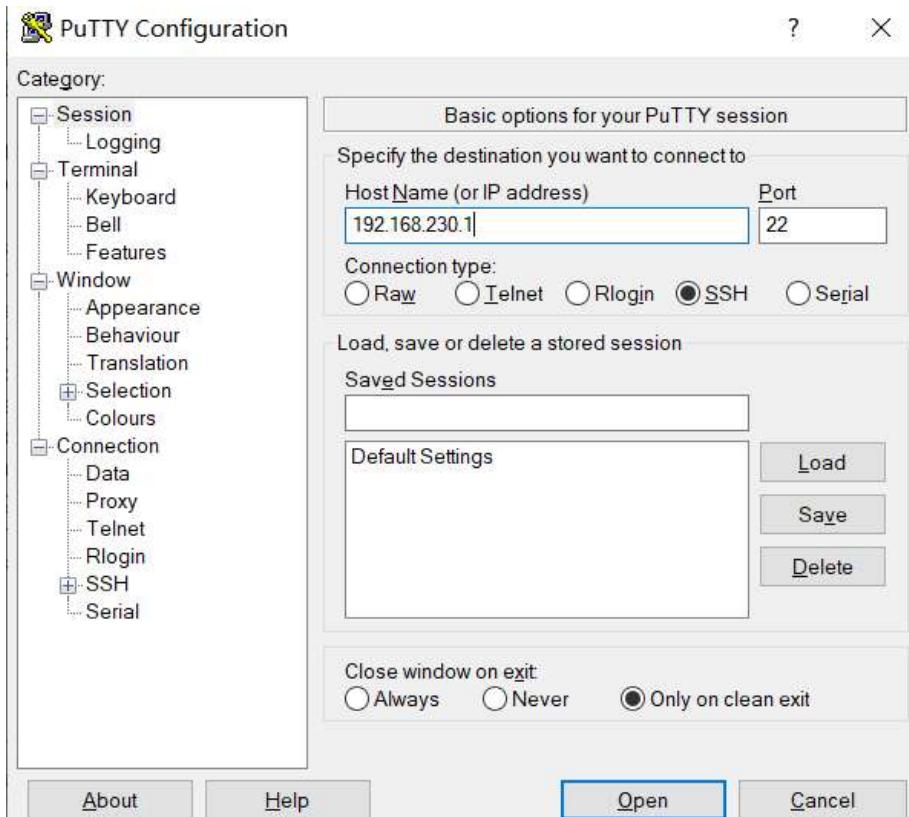
OK, now, you should be able to ping the LoRa gateway from your PC successfully. If it is, you can login RAK7246 through SSH from your PC.

## 5. Login RAK7246 through SSH

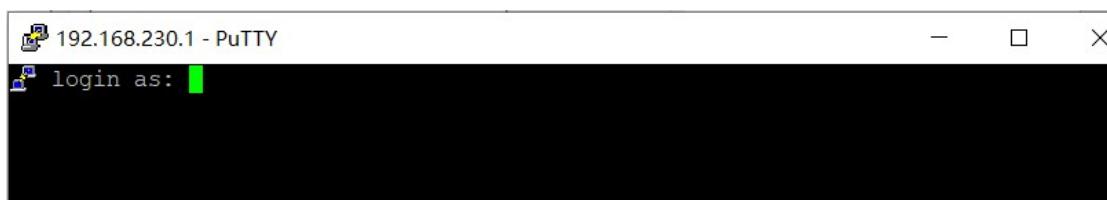
There are 3 cases of your PC.

### 5.1 Your PC's OS is Windows

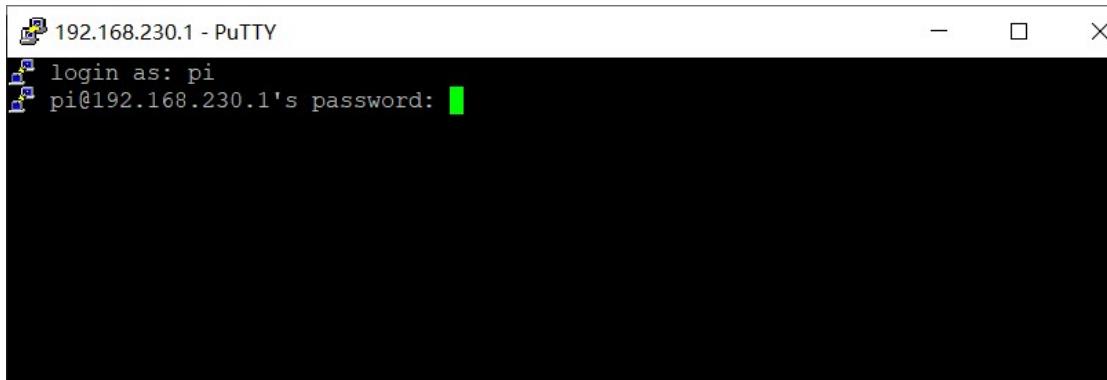
Open the SSH tool on your PC, in this document, we assume you use Putty, and you have connected your PC with RAK7246 through Wi-Fi AP mode which means the IP address of RAK7246 is 192.168.230.1.



Then enter the username and password:

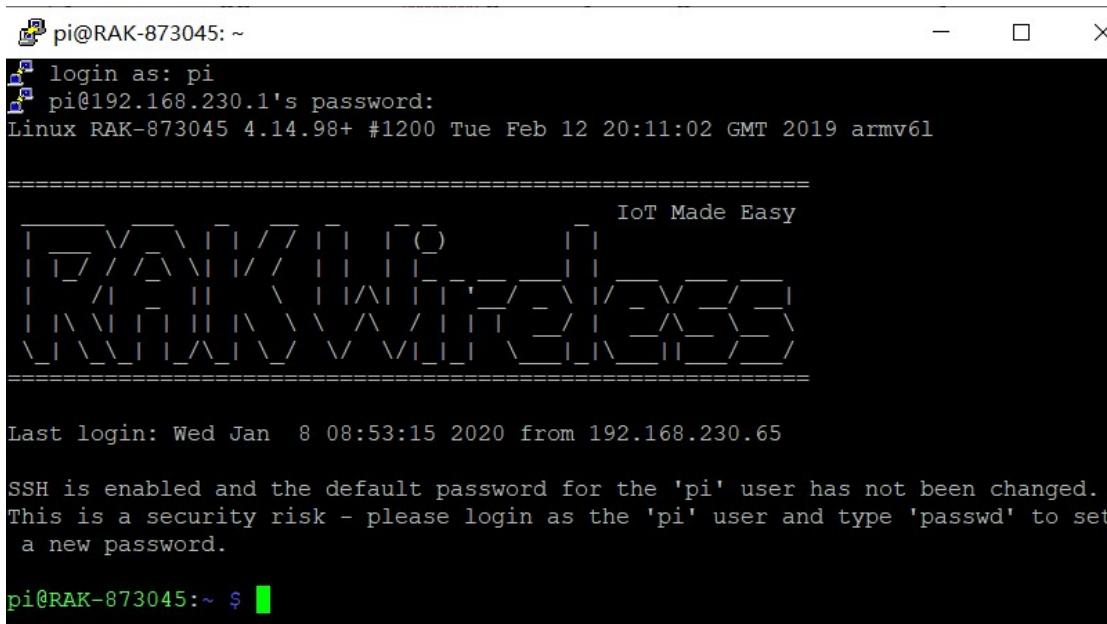


The default username is "pi", and the default password is "raspberry".



If there is a message to let you enter “yes” or “no”, just “yes”.

OK, now, you have logged into RAK7246 through SSH successfully:



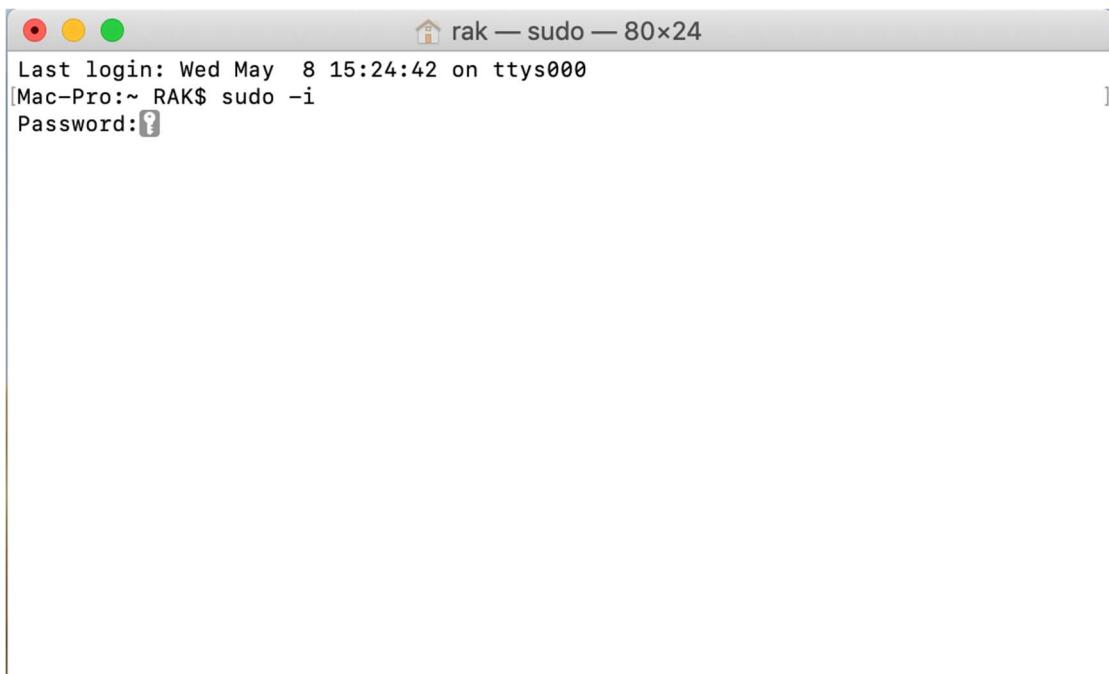
## 5.2 Your PC's OS is Mac OS

Open the terminal of Mac OS. If you don't know how to open it, please Google or Baidu.



```
Last login: Wed May  8 15:24:42 on ttys000
Mac-Pro:~ RAK$
```

If it is not in root mode, please enter “sudo -i”:



```
Last login: Wed May  8 15:24:42 on ttys000
[Mac-Pro:~ RAK$ sudo -i
Password:
```

Enter the password, and you can find it is in root mode now:

```
● ● ● rak — sh — 80x24
Last login: Wed May  8 15:24:42 on ttys000
[Mac-Pro:~ RAK$ sudo -i
[Password:
Mac-Pro:~ root# ]
```

Enter “ssh [pi@192.168.230.1](mailto:pi@192.168.230.1)” to logged into the LoRa gateway, the default password is “raspberry”:

```
● ● ● rak — ssh — 80x24
Last login: Wed Jan 15 11:45:15 on ttys000
[Mac-Pro:~ RAK$ sudo -i
[Password:
Mac-Pro:~ root# ssh pi@192.168.230.1
The authenticity of host '192.168.230.1' can't be established.
ECDSA key fingerprint is SHA256:mtSJsZHtm7yjefLrPtuyNvN2LZIJkFERXDiz13PVx8.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added '192.168.230.1' (ECDSA) to the list of known hosts.
pi@192.168.230.1's password: ]
```

OK, you have logged into the LoRa gateway through SSH successfully:

```
● ● ● rak — pi@RAK-873045: ~ — ssh — 80x24
Last login: Wed Jan 15 11:45:30 on ttys000
[Mac-Pro:~ RAK$ sudo -i
[Password:
Mac-Pro:~ root# ssh pi@192.168.230.1
pi@192.168.230.1's password:
Linux RAK-873045 4.14.98+ #1200 Tue Feb 12 20:11:02 GMT 2019 armv6l
=====
          IoT Made Easy
=====
```



```
=====
Last login: Wed Jan  8 08:54:04 2020 from 192.168.230.65
SSH is enabled and the default password for the 'pi' user has not been changed.
This is a security risk - please login as the 'pi' user and type 'passwd' to set
a new password.

pi@RAK-873045:~ $ ]
```

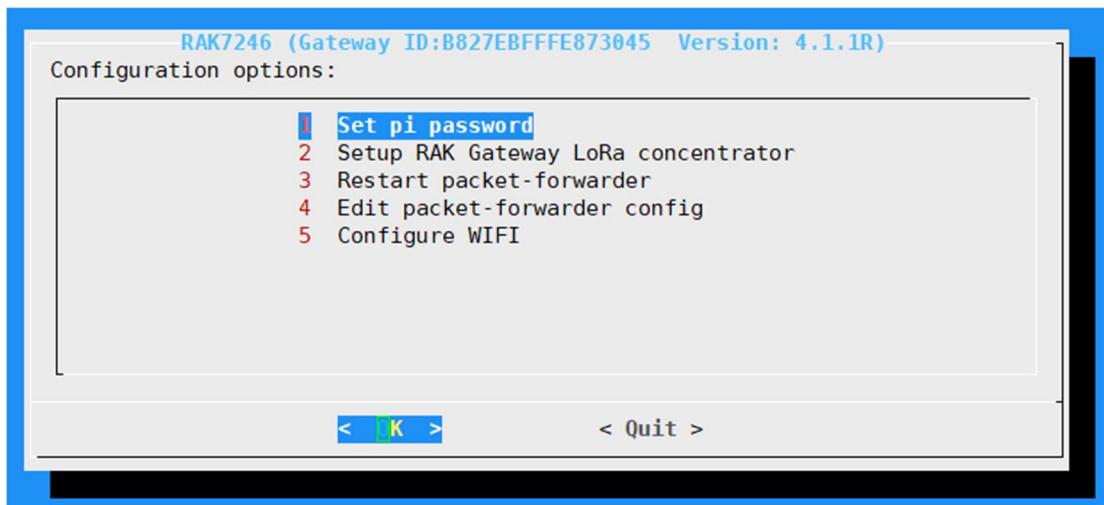
## 5.3 Your PC's OS is Linux

If the OS of your PC is Linux, you should do as same as the Mac OS, except the root mode.

# 6. Configure RAK7246

Now, you have logged into the LoRa gateway through SSH.

Enter a command “sudo gateway-config”, then you will see a page like the following picture shows:



The item 1 is used to set a new password for the LoRa gateway.

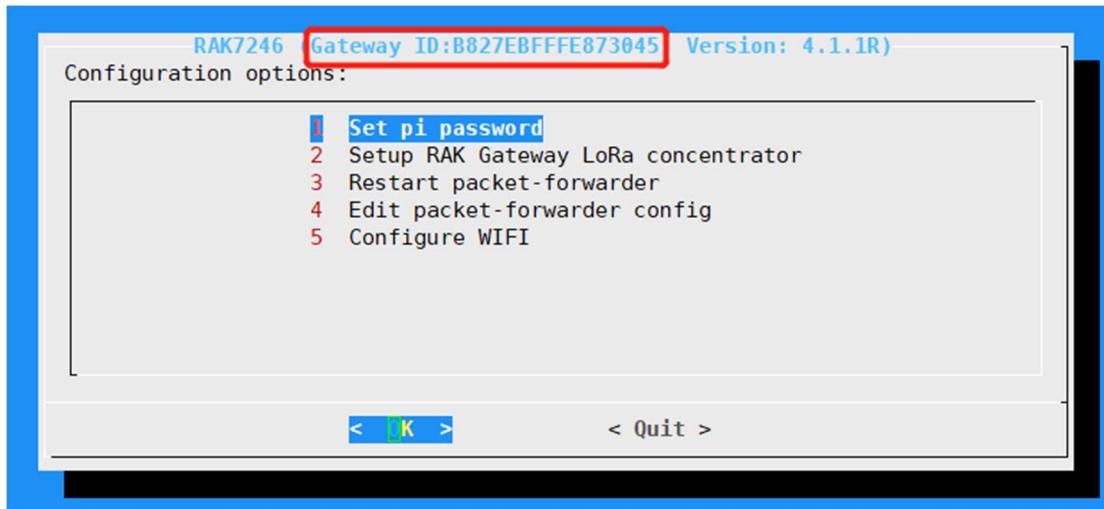
The item 2 is used to config the frequency which the LoRa gateway will work on, and the LoRa server which the LoRa gateway will work with;

The item 3 is used to restart the process of LoRa protocol named packet-forwarder;

The item 4 is used to open the global\_conf.json file which includes almost all configurations about LoRaWAN;

The item 5 is used to config the Wi-Fi function;

Please notice that, there is a very important information on this page, yes, it is “Gateway ID” which will be used when you register your LoRa gateway on a LoRa server:



Surely, there is another way to get “Gateway ID”, just enter a command “gateway-version”, then you will see it as follow:

```
pi@RAK-873045:~ $ gateway-version
Gateway ID:B827EBFFFFE873045
RAKWireless gateway RAK7246 version 4.1.1R
pi@RAK-873045:~ $ █
```

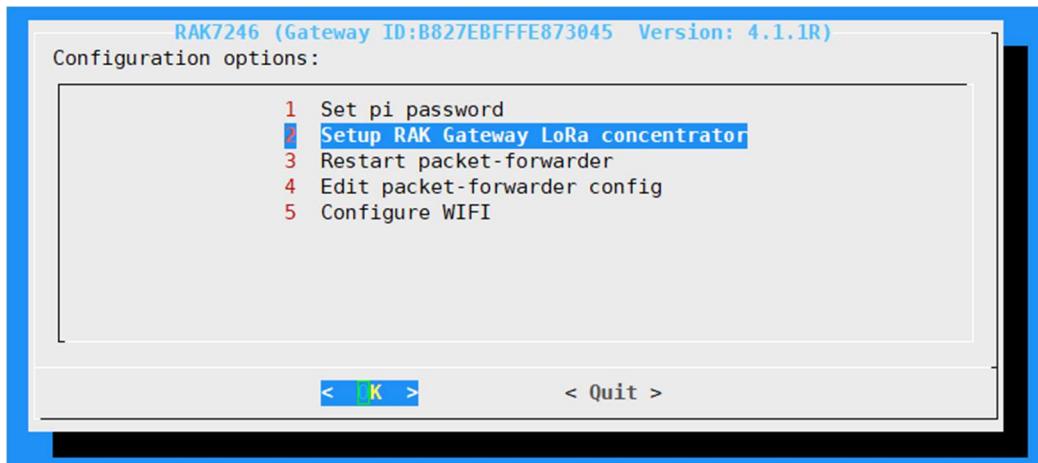
In the following section, we'll do some examples to show how to configure your RAK7246 so that it can work with a LoRa Server like TTN.

## 7. Register RAK7246 with a LoRa Server

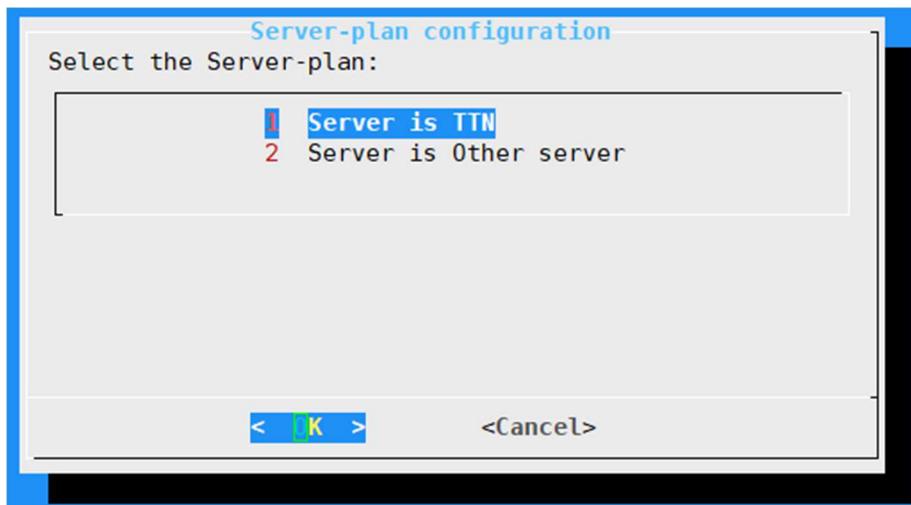
In this section, we'll register RAK7246 with several LoRa Servers to show how to use RAK7246.

### 7.1 Register RAK7246 with TTN

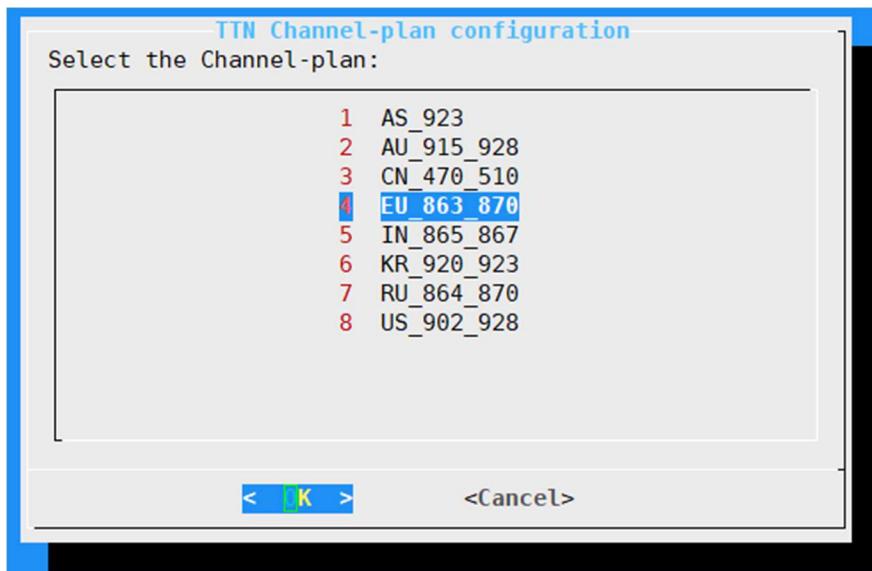
Firstly, choose “2 Setup RAK Gateway LoRa concentrator” and “OK”:



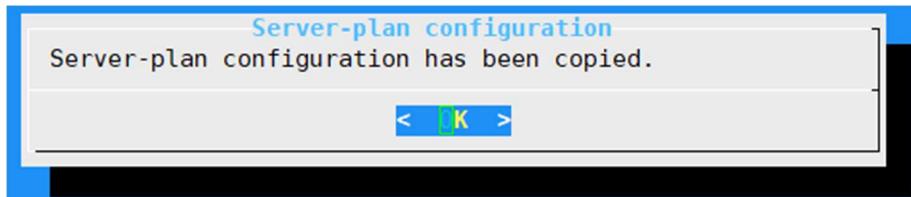
Then choose “1 Server is TTN” and “OK”:



Then choose the frequency you want to use, in this document, we use EU868 (EU\_863\_870):



Just “OK”:



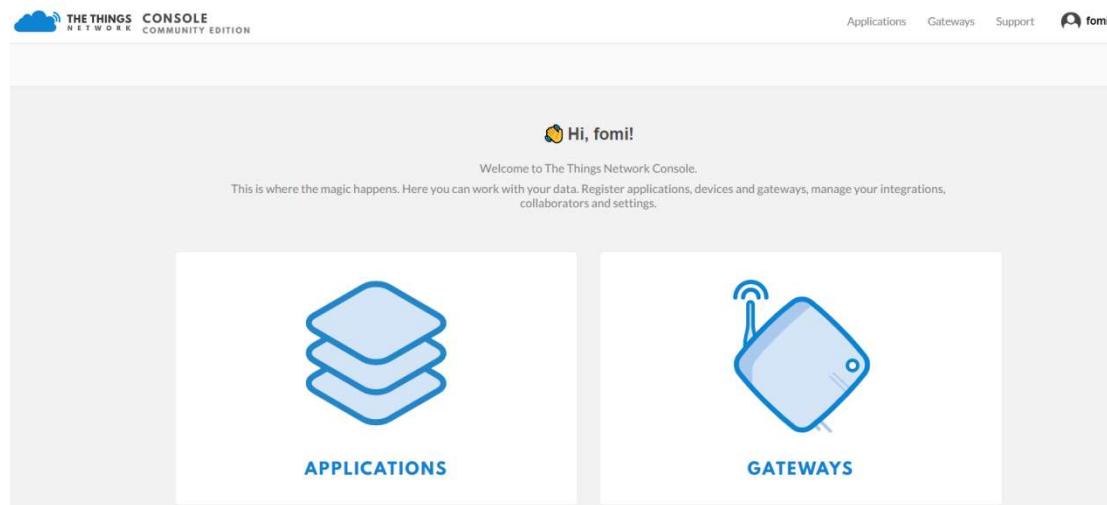
OK, we've configured RAK7246's LoRa parameters.

But we still need to configure RAK7246's WiFi function so that it can access Internet and communicate with TTN. Just do according to “9 How to connect RAK7246 with a WiFi router”.

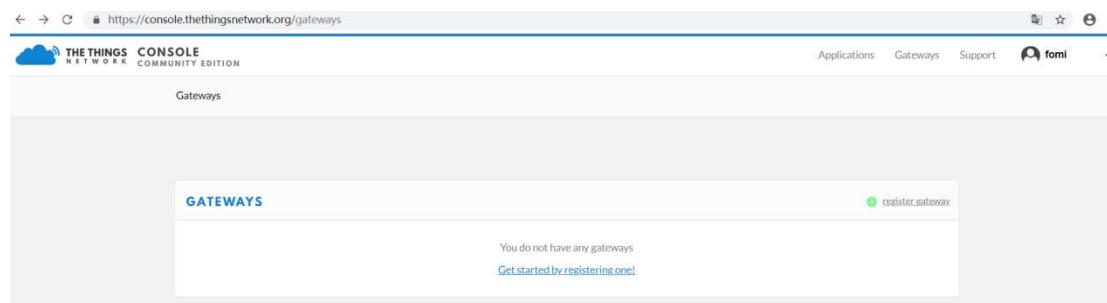
OK, now, open the TTN website <https://www.thethingsnetwork.org/>, and log in, then you will see the following page. Just click “Console” in the drop-down menu of red box.



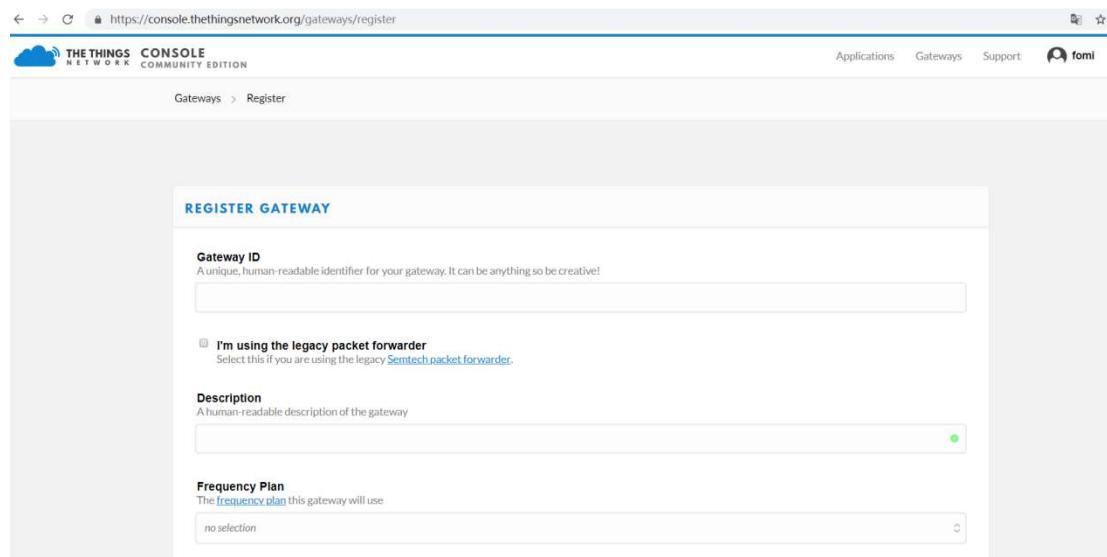
Can you see this page?



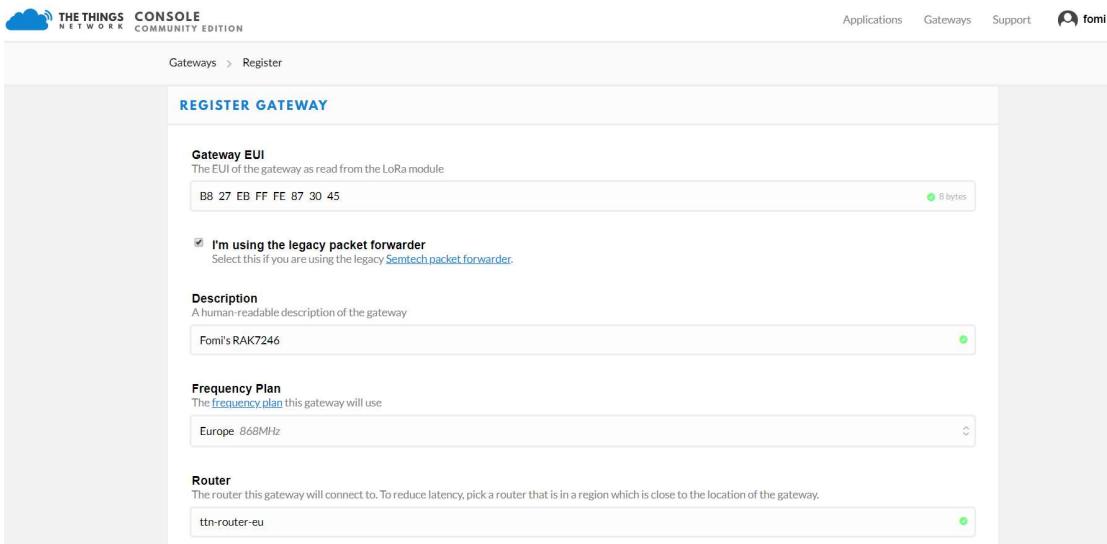
Click “GATEWAYS”:



Click “register gateway”



Fill in them one by one:



**REGISTER GATEWAY**

**Gateway EUI**  
The EUI of the gateway as read from the LoRa module  
B8 27 EB FF FE 87 30 45 8 bytes

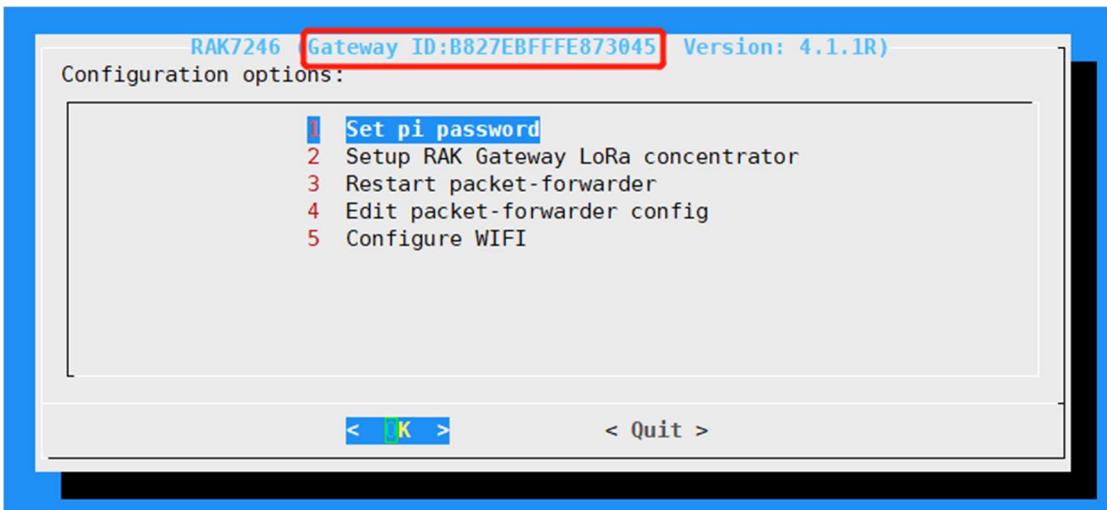
I'm using the legacy packet forwarder  
Select this if you are using the legacy [Semtech packet forwarder](#).

**Description**  
A human-readable description of the gateway  
Fomi's RAK7246

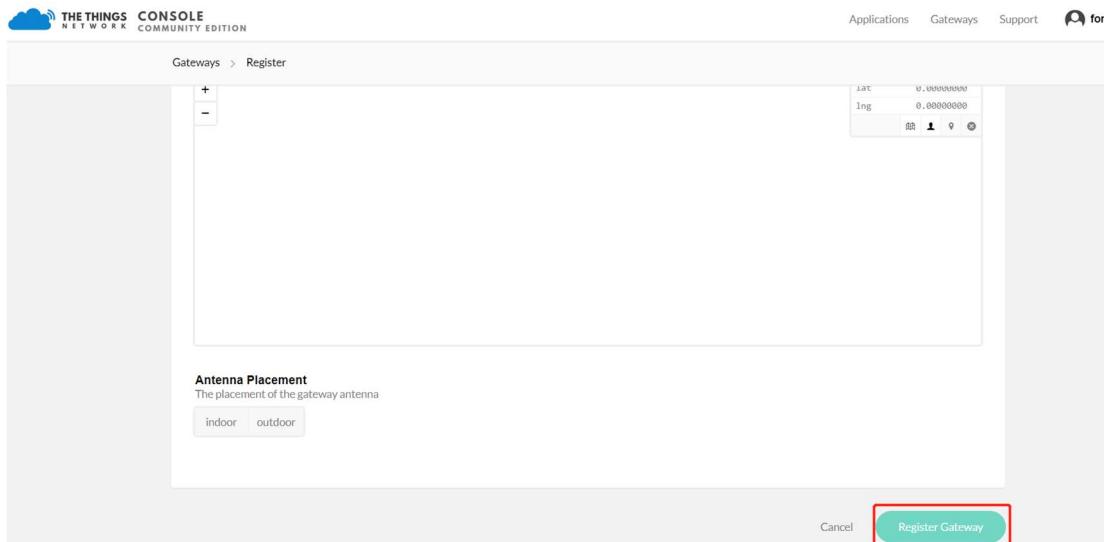
**Frequency Plan**  
The [frequency plan](#) this gateway will use  
Europe 868MHz

**Router**  
The router this gateway will connect to. To reduce latency, pick a router that is in a region which is close to the location of the gateway.  
ttn-router-eu

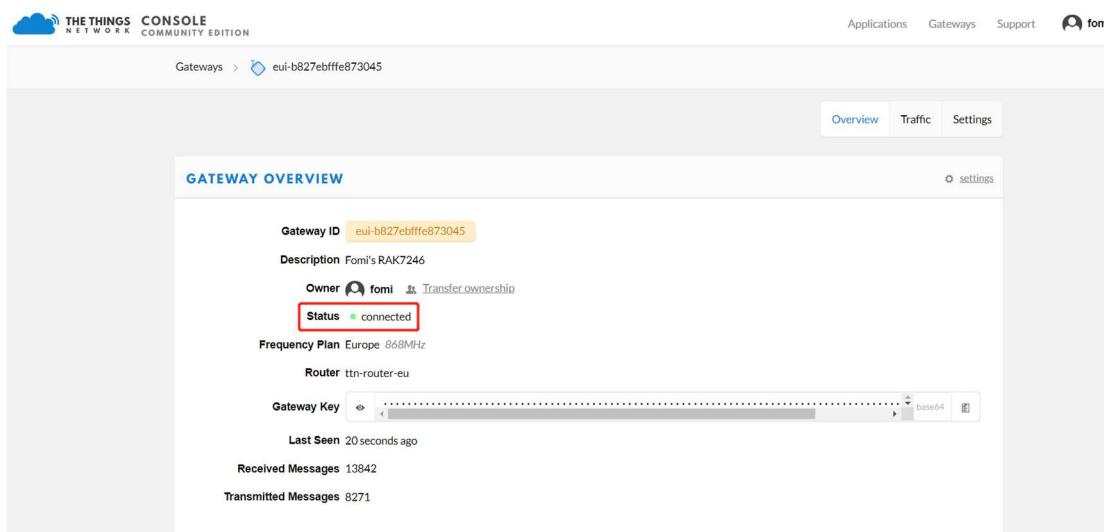
**Note:** Please notice that the “Frequency Plan” is the frequency you want to use, and it must be same with LoRa gateway and LoRa node. The “Gateway EUI” is the one you have ever met in the following page, it must be same with the LoRa gateway’s true “Gateway ID”, otherwise, you will fail to register your LoRa gateway on TTN:



OK, click “Register Gateway” to register.



Do you see the page like as the following picture?



If the “Status” is “connected”, it means your LoRa gateway has connected with TTN!

Otherwise, please check the network and the configurations of your LoRa gateway.

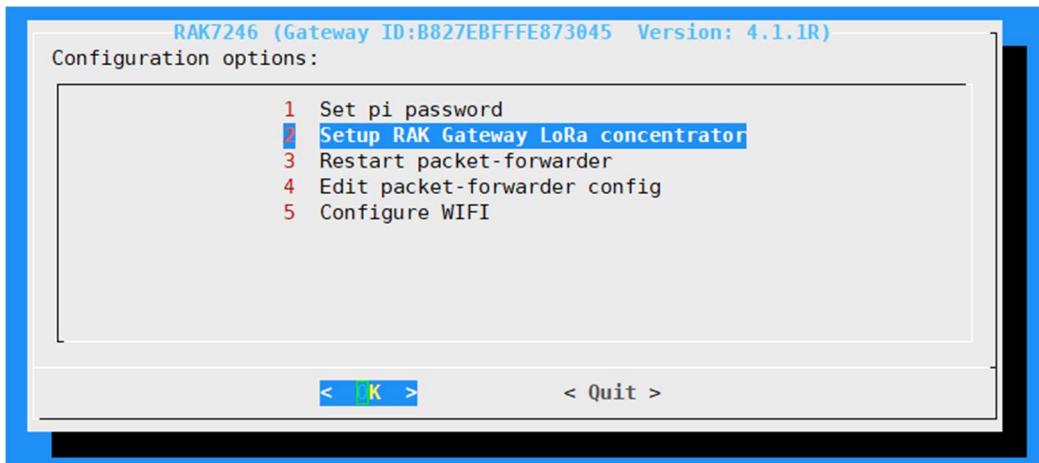
## 7.2 Register RAK7246 with ChirpStack

In this document, we use RAK’s cloud testing EU868 ChirpStack for example.

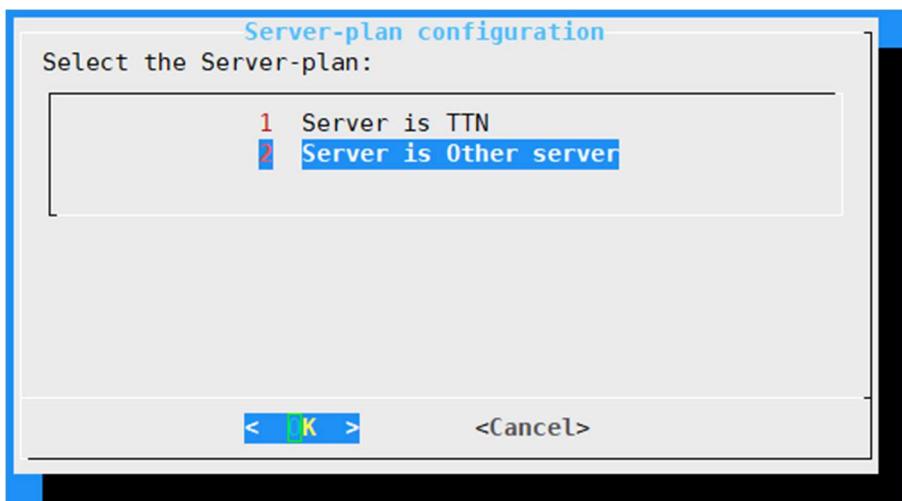
About RAK cloud testing ChirpStack, you can have a look at this topic for more details:

<https://forum.rakwireless.com/t/rak-free-cloud-loraserver-for-testing/344>

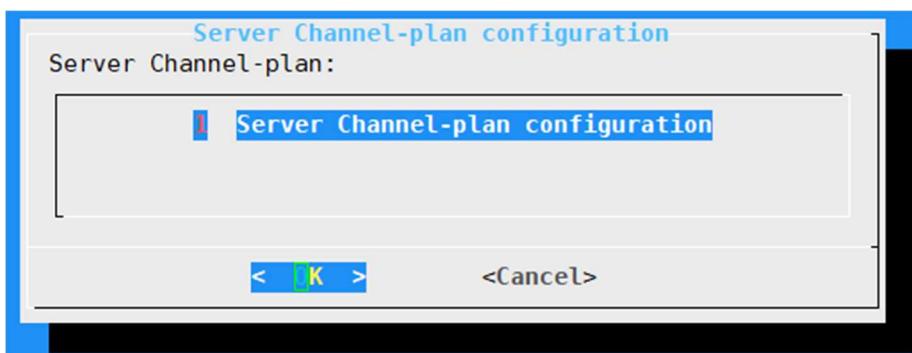
Firstly, choose “2 Setup RAK Gateway LoRa concentrator” and “OK”:



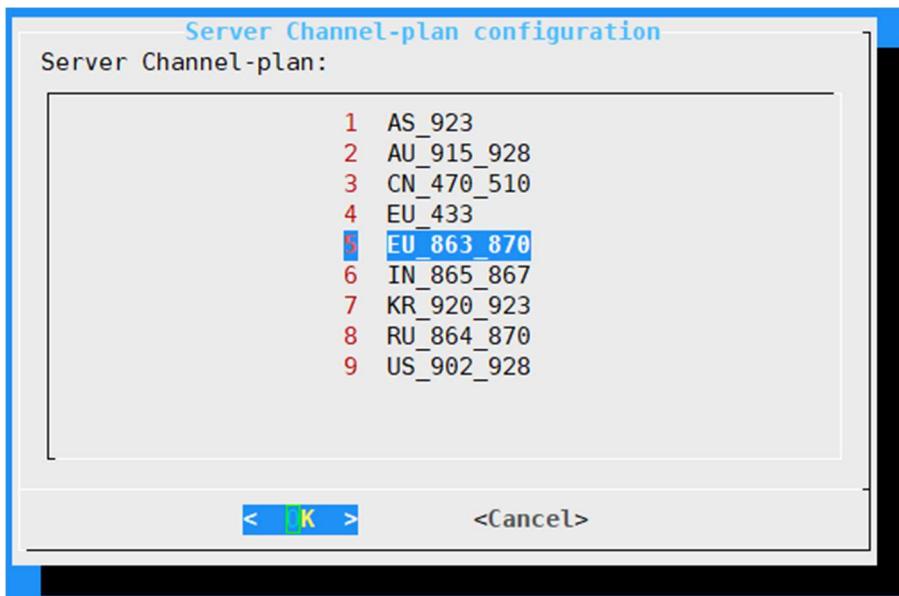
Choose “2 Server is other server”:



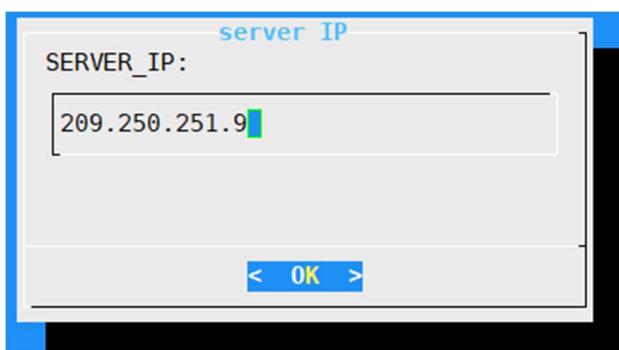
“OK”:



Then choose the frequency, in this document, we use EU868:



After "OK", you will see that you need to fill the IP address of the ChirpStack:



As we said, in this document, we use RAK cloud testing EU868 ChirpStack for example. The IP address of RAK cloud testing EU868 ChirpStack is 209.250.251.9. Surely, if you have another ChirpStack, you can fill its IP address here too.

OK, we've configured RAK7246's LoRa parameters.

But we still need to configure RAK7246's WiFi function so that it can access Internet and communicate with TTN. Just do according to "9 How to connect RAK7246 with a WiFi router".

Now, open RAK cloud testing EU868 ChirpStack webpage:

<http://209.250.251.9:8080/#/login>

# Login

Username \*

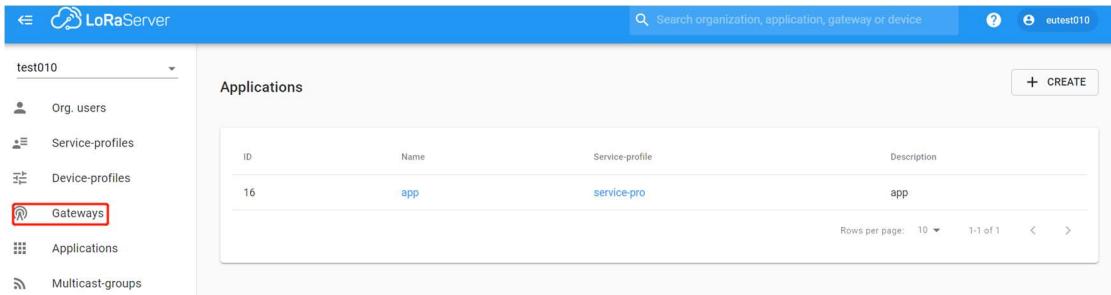
Password \*

**LOGIN**

Note: If you want to use RAK cloud testing ChirpStack, you can ask them for an account and password in this topic:

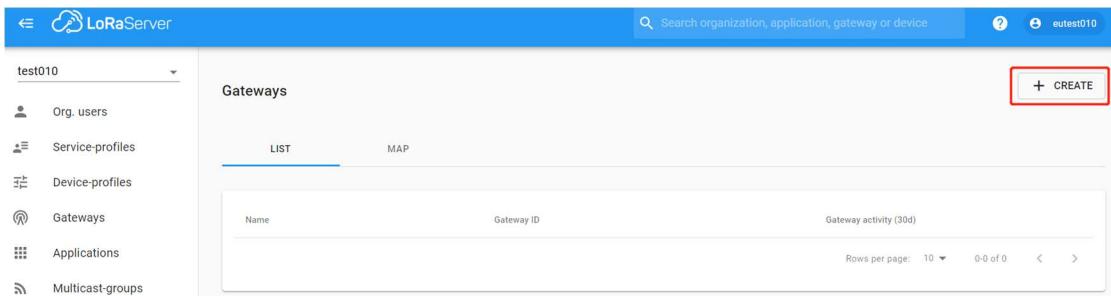
<https://forum.rakwireless.com/t/rak-free-cloud-loraserver-for-testing/344>

OK, Login it and Click “Gateways” in the left menu:



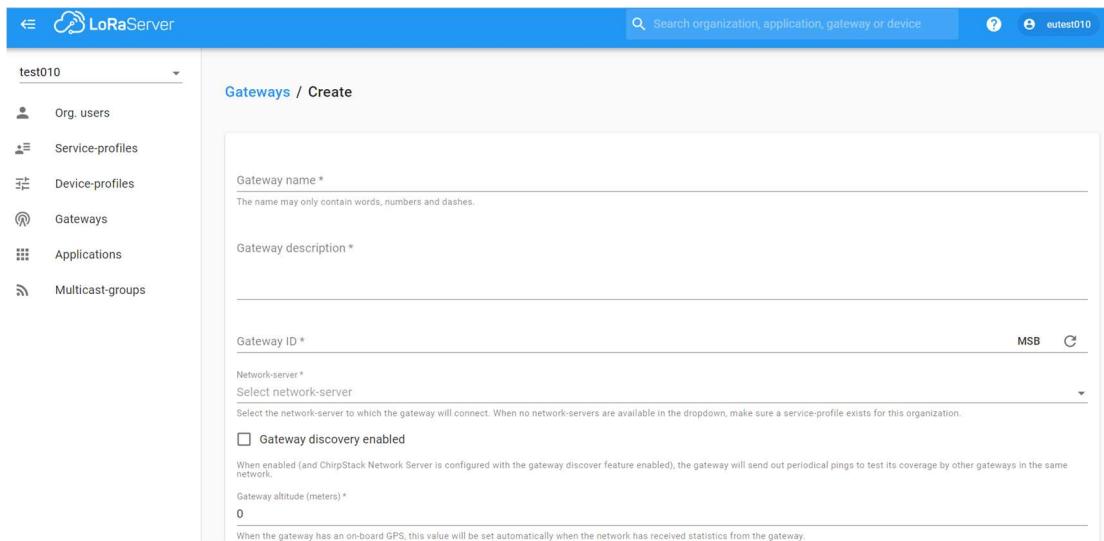
ID	Name	Service-profile	Description
16	app	service-pro	app

Then, click “+CREATE” button to create a new LoRa gateway:



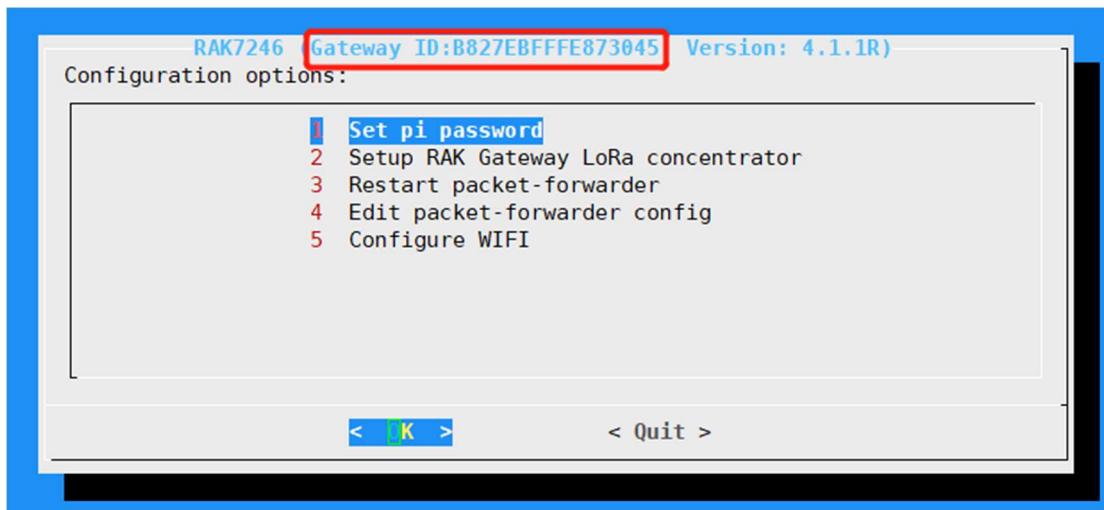
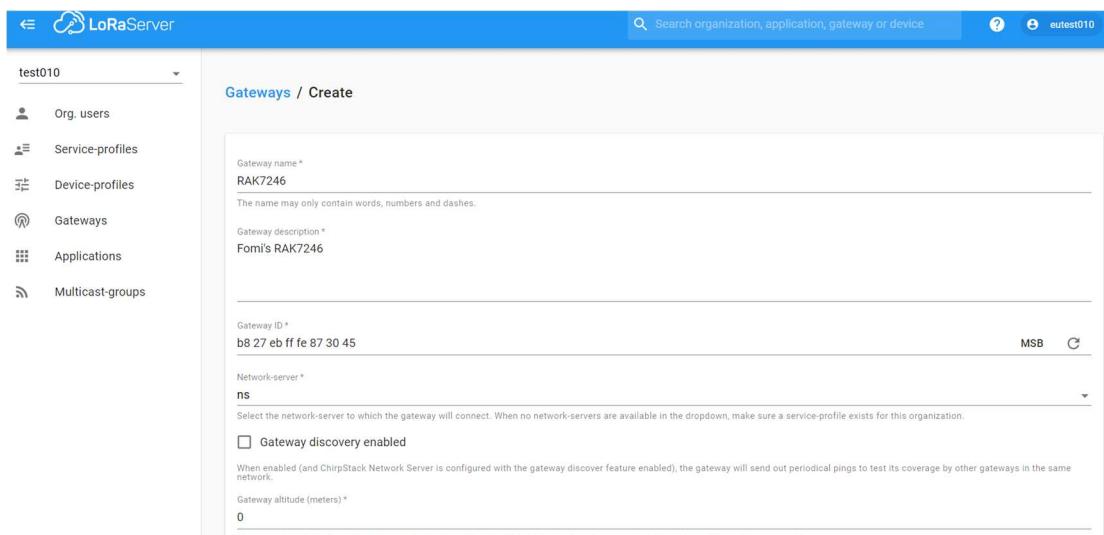
Name	Gateway ID	Gateway activity (30d)

You will see the following page:



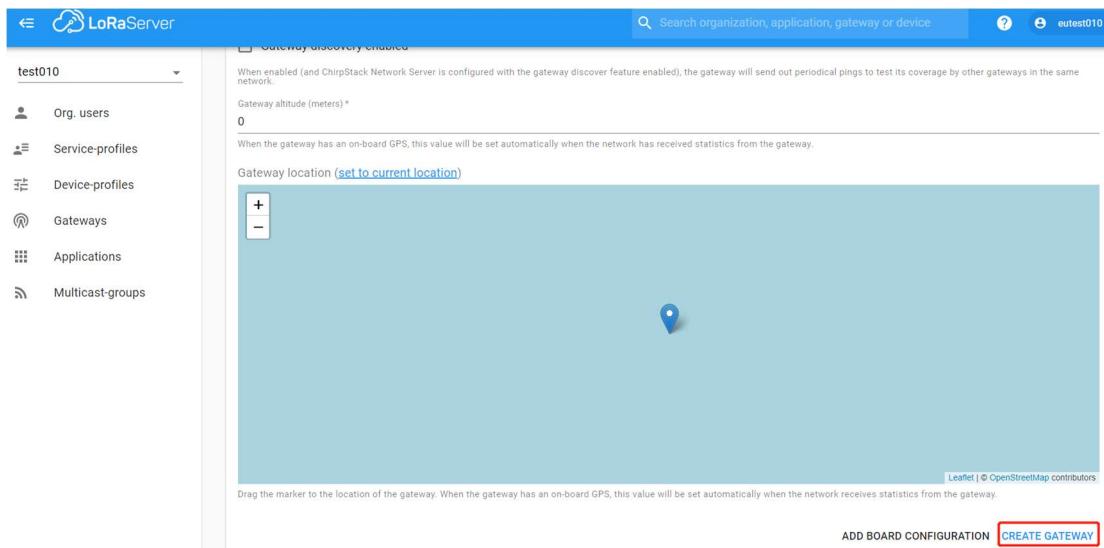
The screenshot shows the LoRaServer interface for creating a new gateway. The left sidebar shows organization navigation. The main form has fields for 'Gateway name', 'Gateway description', 'Gateway ID' (which is highlighted with a red box), 'Network-server', 'Gateway discovery enabled', and 'Gateway altitude'. A note at the bottom states: 'When the gateway has an on-board GPS, this value will be set automatically when the network has received statistics from the gateway.'

Just fill the correct content. Please note that the “Gateway ID” must be same with the gateway EUI which you have see in RAK7246’s configuration UI:

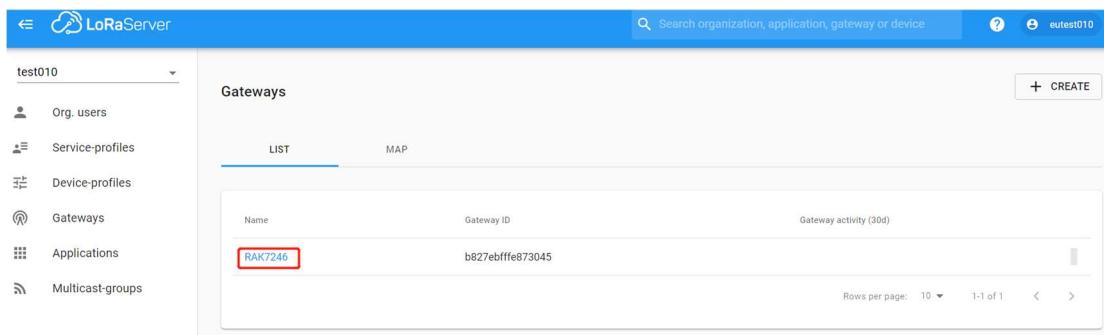



The screenshot shows the LoRaServer interface for creating a new gateway. The left sidebar shows organization navigation. The main form has fields for 'Gateway name' (set to 'RAK7246'), 'Gateway description' (set to 'Fomi's RAK7246'), 'Gateway ID' (set to 'b8 27 eb ff fe 87 30 45'), 'Network-server' (set to 'ns'), and 'Gateway altitude'. A note at the bottom states: 'When the gateway has an on-board GPS, this value will be set automatically when the network has received statistics from the gateway.'

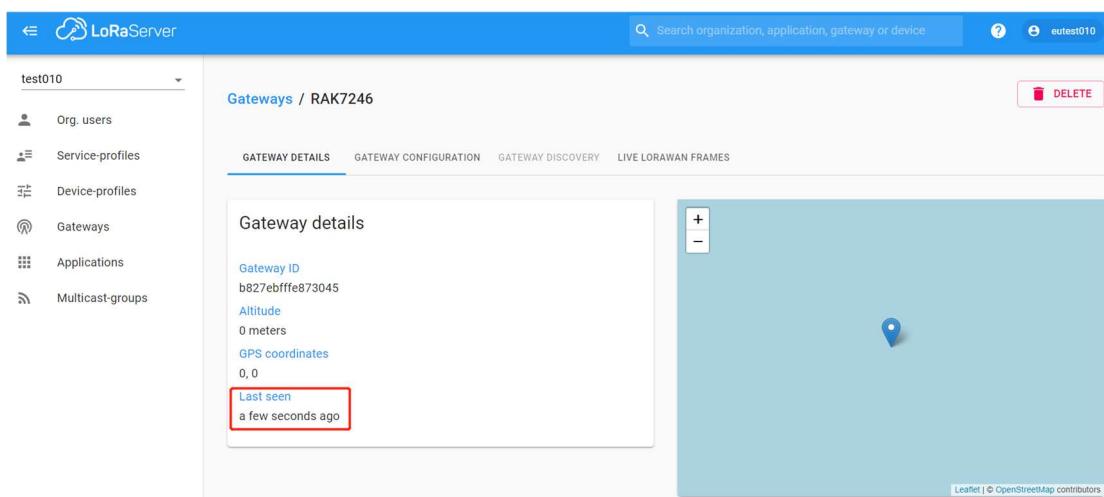
After done, just click “CREATE GATEWAY” to complete:



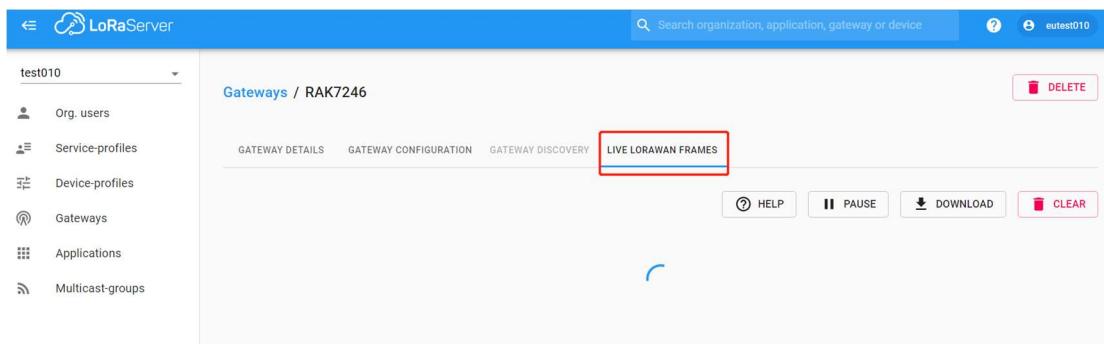
Then you will see the following page, just click the name of the gateway you just create:



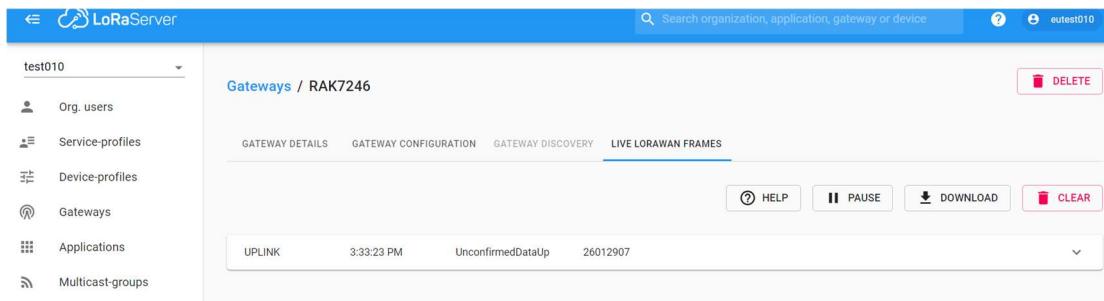
You can see that the “Last seen” is “a few seconds ago” in the following page, which means that your RAK7246 has been registered with this ChirpStack successfully!



Once there are some LoRa packets sending from LoRa nodes to your RAK7246, you can see these packets in the following page:



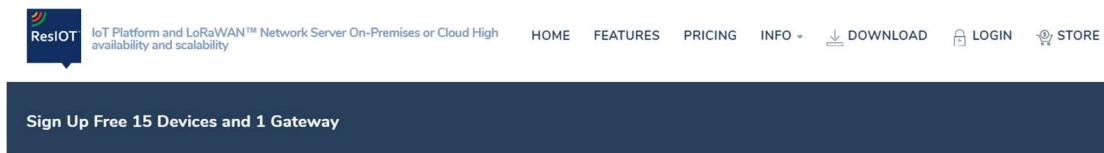
The screenshot shows the LoRaServer interface for a gateway named RAK7246. The left sidebar includes options like Org. users, Service-profiles, Device-profiles, Gateways, Applications, and Multicast-groups. The main area has tabs for GATEWAY DETAILS, GATEWAY CONFIGURATION, GATEWAY DISCOVERY, and LIVE LORAWAN FRAMES, with the latter being highlighted by a red box. Below these tabs are buttons for HELP, PAUSE, DOWNLOAD, and CLEAR.



This screenshot shows a detailed view of a LORAWAN frame under the LIVE LORAWAN FRAMES tab. The frame information includes UPLINK, timestamp (3:33:23 PM), message type (UnconfirmedDataUp), and sequence number (26012907). Navigation buttons for HELP, PAUSE, DOWNLOAD, and CLEAR are visible at the bottom.

## 7.3 Register RAK7246 with RESIOT

First, open RESIOT website <https://www.resiot.io/en/sign-up-free/> to sign up using your email:



The ResiOT sign-up page features a prominent "Sign Up Free 15 Devices and 1 Gateway" button. The header includes the ResiOT logo and the tagline "IoT Platform and LoRaWAN™ Network Server On-Premises or Cloud High availability and scalability". The navigation bar offers links to HOME, FEATURES, PRICING, INFO, DOWNLOAD, LOGIN, and STORE.

Register your free ResiOT™ Universal IoT Platform account in 10 seconds! Immediate activation!

Enter your email address

fomi@rakwireless.com

Select the desired free service

FREE Private Cloud

- 15 devices
- 1 LoRaWAN™ gateway
- Unlimited uplinks/downlinks
- LoRaWAN™ Network Server
- API/Connectors/Smart Scenes/LUA Scripting Advanced Scenes
- 5 days data retention
- Instructions for access to the cloud service will be sent by email

On-premise FSI FREE License

- 5 devices
- 1 LoRaWAN™ gateway
- Unlimited uplinks/downlinks
- LoRaWAN™ Network Server
- API/Connectors/Smart Scenes/LUA Scripting Advanced Scenes
- Available for Windows/Linux
- Instructions for installation and download will be sent by email

**Sign up free**

After "Sign up free", you need to fill some information:

Complete your registration to: FREE Private Cloud Shared

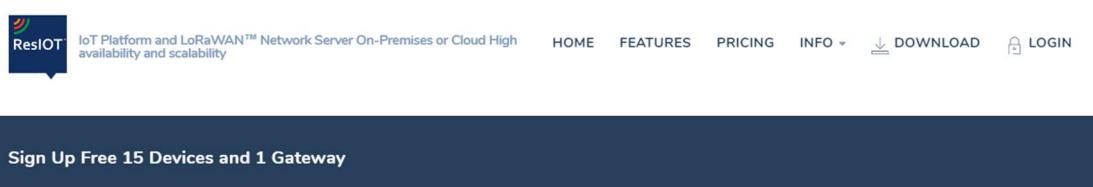
fomi@rakwireless.com	
Key .....  .....	
.....	
Fomi	
Tong	
Default Language (English)	
United Kingdom	
Company Name (Optional)	
Street Address	
City	
State	
Postcode	

By continuing, you certify you have read and agree to the Terms of Service

**SIGN UP FREE**

After “SIGN UP FREE”, you will receive two emails including a link, a username and password.

Meanwhile, the web page will jump to the following one, just click that link:



The screenshot shows the Resiot sign-up page. At the top, there's a navigation bar with the Resiot logo, a tagline "IoT Platform and LoRaWAN™ Network Server On-Premises or Cloud High availability and scalability", and links for HOME, FEATURES, PRICING, INFO, DOWNLOAD, LOGIN, and a dropdown menu. Below the navigation is a large green button labeled "Sign Up Free 15 Devices and 1 Gateway".

 You have successfully registered!

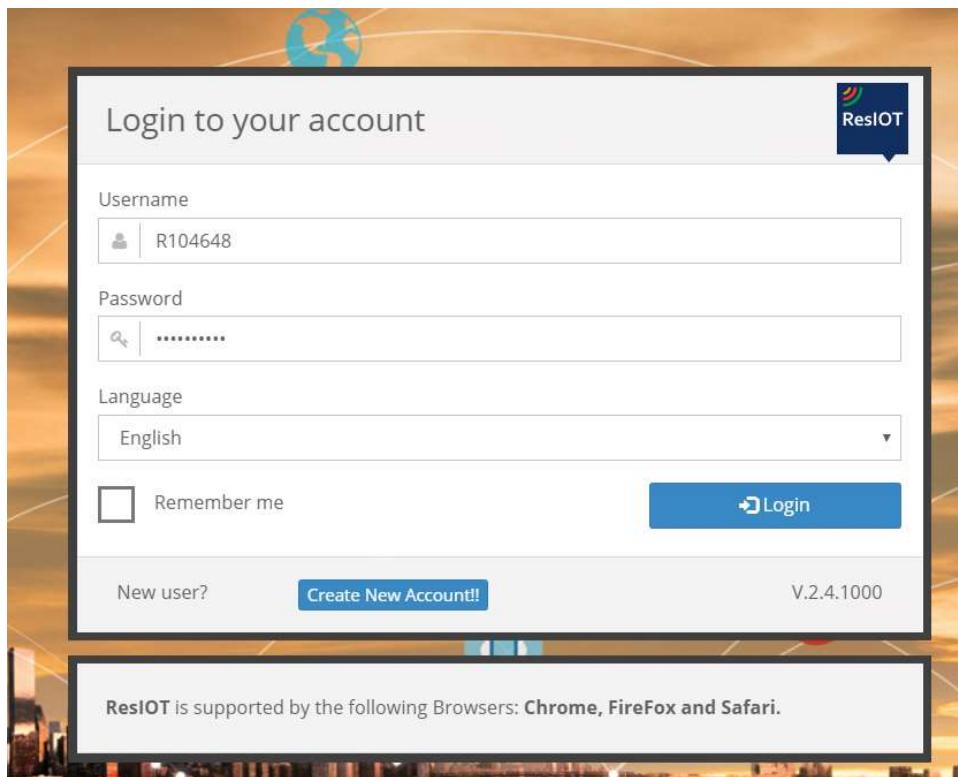
Here are your credentials:

Your Username: **R104648**

Link to the application site: <https://eu72.resiot.io>

Check your email inbox to activate your account and retrieve your password!

You will see the login page:

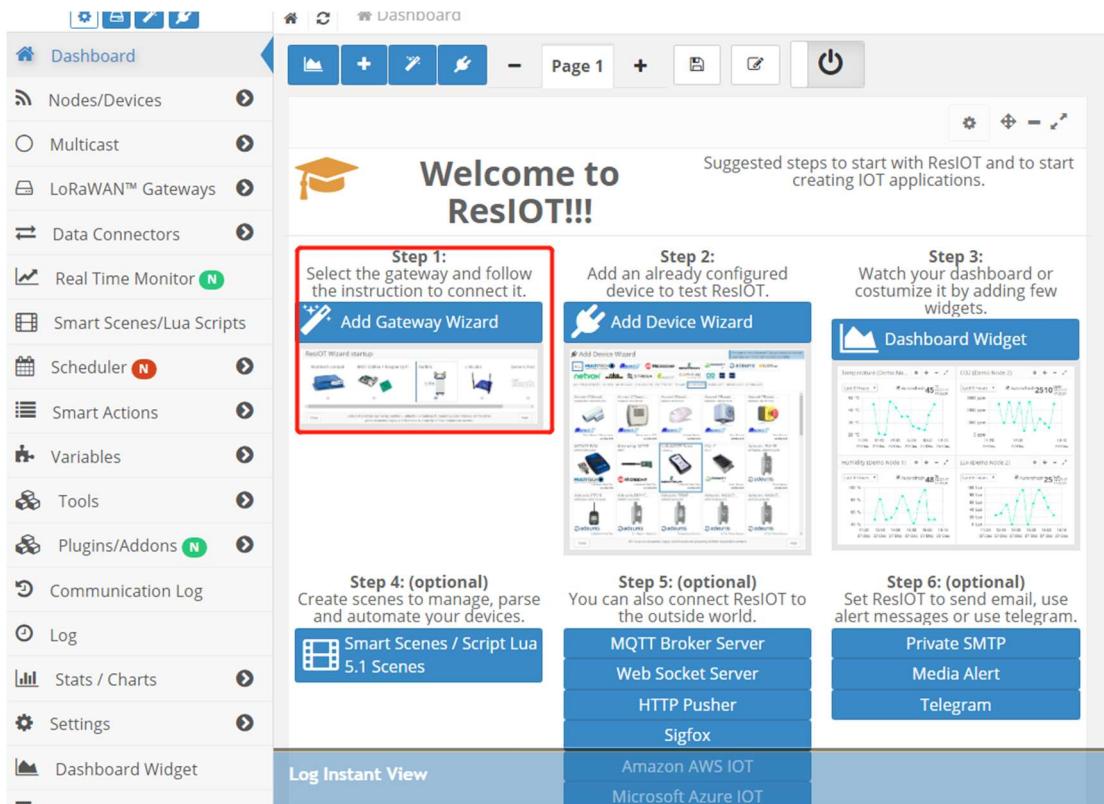


Just login using the username and password in the email RESIOT send to you.

Then you can see the following page:

In this document, we “Choose” EU868 region.

Then, click the “Step 1: Add Gateway Wizard” as the following red box:



**Welcome to ResIOT!!!**

Suggested steps to start with ResIOT and to start creating IOT applications.

**Step 1:** Select the gateway and follow the instruction to connect it.  
**Add Gateway Wizard**

**Step 2:** Add an already configured device to test ResIOT.  
**Add Device Wizard**

**Step 3:** Watch your dashboard or customize it by adding few widgets.  
**Dashboard Widget**

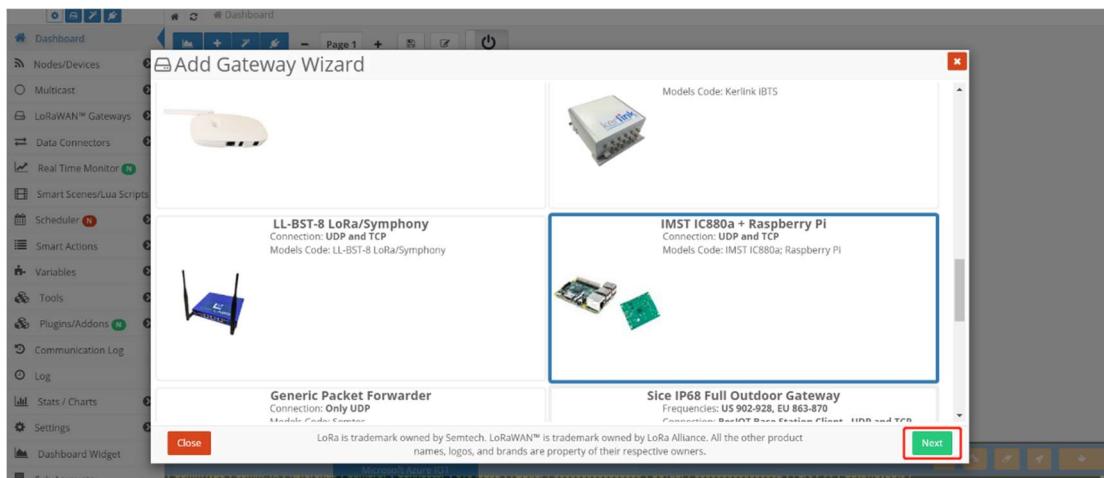
**Step 4: (optional)** Create scenes to manage, parse and automate your devices.  
**Smart Scenes / Script Lua 5.1 Scenes**

**Step 5: (optional)** You can also connect ResIOT to the outside world.  
**MQTT Broker Server**  
**Web Socket Server**  
**HTTP Pusher**  
**Sigfox**

**Step 6: (optional)** Set ResIOT to send email, use alert messages or use telegram.  
**Private SMTP**  
**Media Alert**  
**Telegram**

**Log Instant View**

You will see a lot of LoRa gateways, and there is an item named “IMST iC880a + Raspberry Pi”, just choose it:



**Add Gateway Wizard**

Models Code: Kerlink IBTS

LL-BST-8 LoRa/Symphony  
Connection: UDP and TCP  
Models Code: LL-BST-8 LoRa/Symphony

IMST IC880a + Raspberry Pi  
Connection: UDP and TCP  
Models Code: IMST IC880a; Raspberry Pi

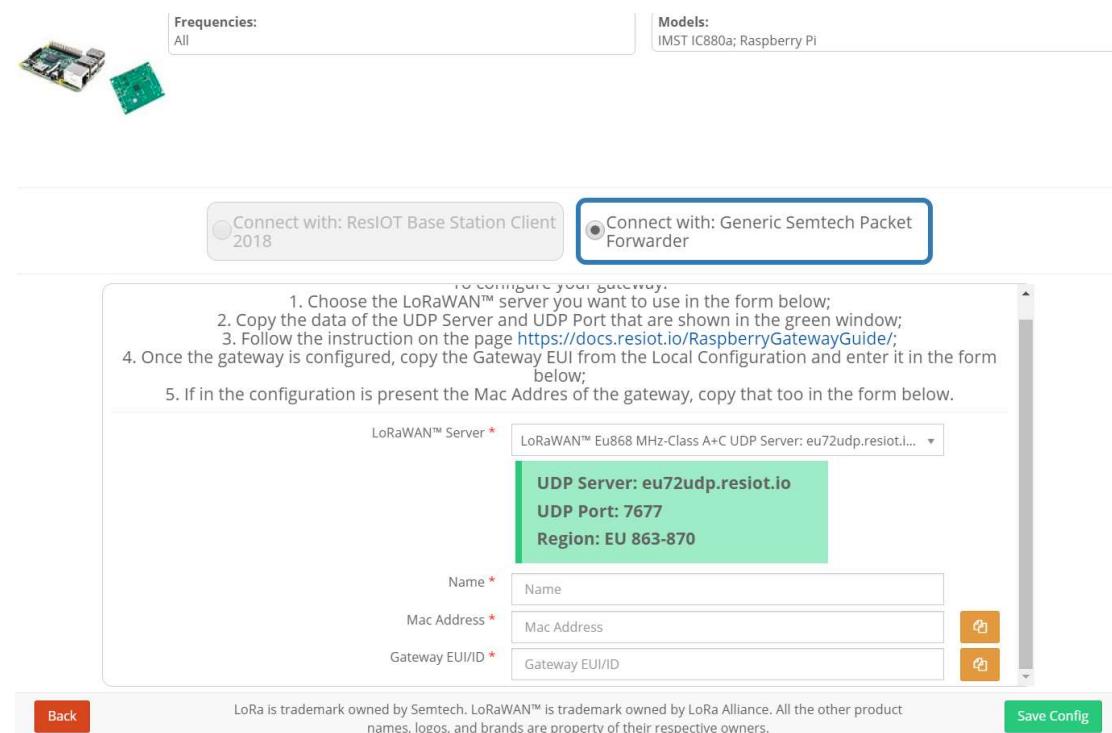
Generic Packet Forwarder  
Connection: Only UDP  
Models Code: GPF

Sice IP68 Full Outdoor Gateway  
Frequencies: US 902-928, EU 863-870  
Comments: SiceIP68 Full Outdoor Gateway, UDP and TCP

**Close** **Next**

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Click “Next” button.



Frequencies: All

Models: IMST IC880a; Raspberry Pi

Connect with: ResIOT Base Station Client

Connect with: Generic Semtech Packet Forwarder

To configure your gateway:

- Choose the LoRaWAN™ server you want to use in the form below;
- Copy the data of the UDP Server and UDP Port that are shown in the green window;
- Follow the instruction on the page <https://docs.resiot.io/RaspberryGatewayGuide/>;
- Once the gateway is configured, copy the Gateway EUI from the Local Configuration and enter it in the form below;
- If in the configuration is present the Mac Address of the gateway, copy that too in the form below.

LoRaWAN™ Server \*

LoRaWAN™ Eu868 MHz-Class A+C UDP Server: eu72udp.resiot.io...

UDP Server: eu72udp.resiot.io

UDP Port: 7677

Region: EU 863-870

Name \*

Mac Address \*

Gateway EUI/ID \*

Back

Save Config

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Fill “Name” with any content.

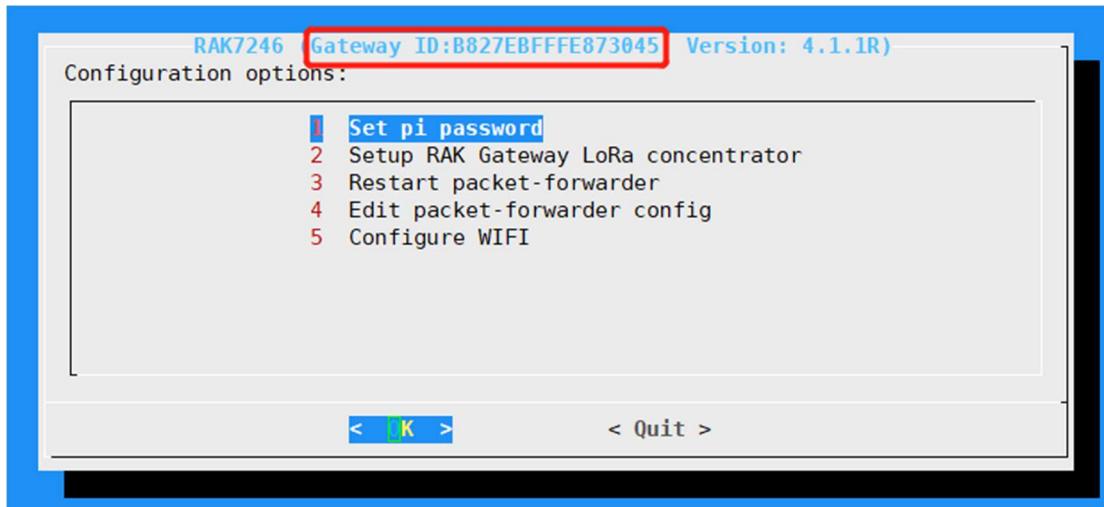
Fill “Mac Address” with the WiFi MAC address of your RAK7246, which you can get from the tag stick on your RAK7246 device, or using “ifconfig” command in RAK7246.

```
pi@RAK-873045:~ $ ifconfig
lo: flags=73<UP,LOOPBACK,RUNNING> mtu 65536
    inet 127.0.0.1 netmask 255.0.0.0
        inet6 ::1 prefixlen 128 scopeid 0x10<host>
            loop txqueuelen 1000 (Local Loopback)
            RX packets 10379 bytes 721341 (704.4 KiB)
            RX errors 0 dropped 0 overruns 0 frame 0
            TX packets 10379 bytes 721341 (704.4 KiB)
            TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

usb0: flags=4099<UP,BROADCAST,MULTICAST> mtu 1500
    ether aa:86:7c:68:98:81 txqueuelen 1000 (Ethernet)
    RX packets 0 bytes 0 (0.0 B)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 0 bytes 0 (0.0 B)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

wlan0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
    inet 192.168.230.1 netmask 255.255.255.0 broadcast 192.168.230.255
    inet6 fe80::50b2:1f96:d29e:d0ca prefixlen 64 scopeid 0x20<link>
        ether b8:27:eb:87:30:45 txqueuelen 1000 (Ethernet)
        RX packets 309 bytes 29487 (28.7 KiB)
        RX errors 0 dropped 1 overruns 0 frame 0
        TX packets 943 bytes 84375 (82.3 KiB)
        TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0
```

Fill “Gateway EUI/ID” with the Gateway EUI of your RAK7246, which you can get on the configuration page of RAK7246:



Frequencies: All | Models: IMST IC880a; Raspberry Pi

Connect with: ResIOT Base Station Client 2018     Connect with: Generic Semtech Packet Forwarder

To configure your gateway:

- Choose the LoRaWAN™ server you want to use in the form below;
- Copy the data of the UDP Server and UDP Port that are shown in the green window;
- Follow the instruction on the page <https://docs.resiot.io/RaspberryGatewayGuide/>;
- Once the gateway is configured, copy the Gateway EUI from the Local Configuration and enter it in the form below;
- If in the configuration is present the Mac Address of the gateway, copy that too in the form below.

LoRaWAN™ Server \* LoRaWAN™ Eu868 MHz-Class A+ UDP Server: eu72udp.resiot... ▾

UDP Server: eu72udp.resiot.io
UDP Port: 7677
Region: EU 863-870

Name \* RAK7246

Mac Address \* b8 : 27 : eb : 87 : 30 : 45

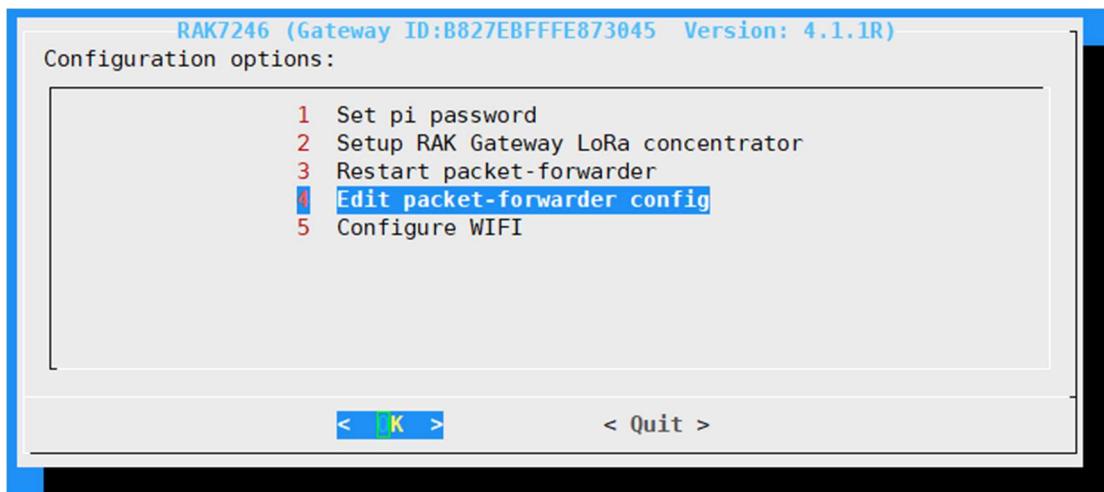
Gateway EUI/ID \* b8 : 27 : eb : ff : fe : 87 : 30 : 45

Back | Save Config

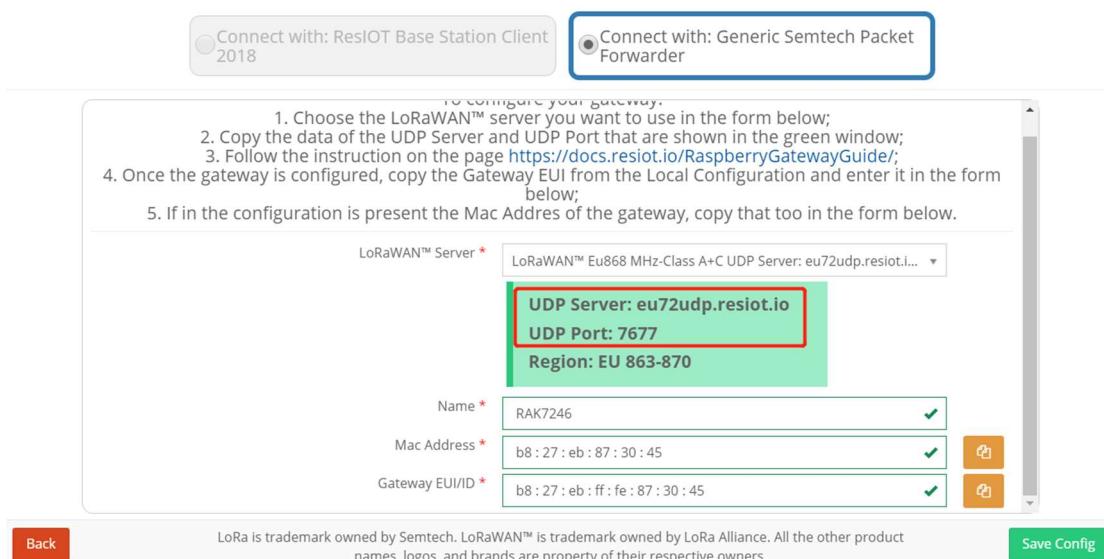
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Then “Save Config”.

Now, login your RAK7246 through SSH, and choose “3 Edit packet-forwarder config”:



It will open the global\_conf.json file which is the configuration file of LoRaWAN function. Please modify the content of the following red box according to the RESIOT website shows:



The screenshot shows the "Connect with: ResiOT Base Station Client" configuration page. It has two tabs: "LoRaWAN™ Server" (selected) and "Generic Semtech Packet Forwarder".

Instructions for configuration:

1. Choose the LoRaWAN™ server you want to use in the form below;
2. Copy the data of the UDP Server and UDP Port that are shown in the green window;
3. Follow the instruction on the page <https://docs.resiot.io/RaspberryGatewayGuide/>;
4. Once the gateway is configured, copy the Gateway EUI from the Local Configuration and enter it in the form below;
5. If in the configuration is present the Mac Address of the gateway, copy that too in the form below.

Form fields (highlighted in red box):

- LoRaWAN™ Server: eu868 MHz-Class A+C UDP Server: eu72udp.resiot.i...
- UDP Server: eu72udp.resiot.io
- UDP Port: 7677
- Region: EU 863-870

Other form fields:

- Name \*: RAK7246
- Mac Address \*: b8 : 27 : eb : 87 : 30 : 45
- Gateway EUI/ID \*: b8 : 27 : eb : ff : fe : 87 : 30 : 45

Buttons at the bottom: "Back", "Save Config", and "LoRa is trademark owned by Semtech. LoRaWAN™ is trademark owned by LoRa Alliance. All the other product names, logos, and brands are property of their respective owners."

```

"gateway_conf": {
    "gateway_ID": "0000000000000000",
    /* change with default server address/ports, or overwrite in local_conf.json */
    "server_address": "eu72udp.resiot.io",
    "serv_port_up": 7677,
    "serv_port_down": 7677,
    /* adjust the following parameters for your network */
    "keepalive_interval": 10,
    "stat_interval": 30,
    "push_timeout_ms": 100,
    /* forward only valid packets */
    "forward_crc_valid": true,
    "forward_crc_error": false,
    "forward_crc_disabled": false,
    /* gps enable */
    "gps": true,
    "gps_tty_path": "/dev/ttyAMA0",
    "fake_gps": false,
    "ref_latitude": 10,
    "ref_longitude": 20,
    "ref_altitude": -1,
    "autoquit_threshold": 20
}

```

CTL + X:

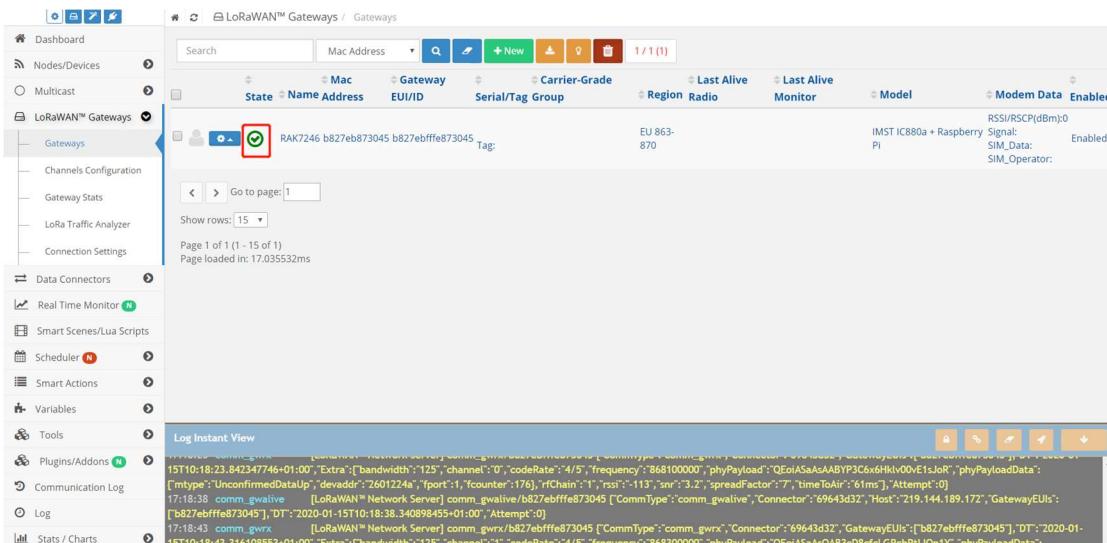
```
"gateway_conf": {
    "gateway_ID": "0000000000000000",
    /* change with default server address/ports, or overwrite in local_conf.json */
    "server_address": "eu7udp.resiot.io",
    "serv_port_up": 7677,
    "serv_port_down": 7677,
    /* adjust the following parameters for your network */
    "keepalive_interval": 10,
    "stat_interval": 30,
    "push_timeout_ms": 100,
    /* forward only valid packets */
    "forward_crc_valid": true,
    "forward_crc_error": false,
    "forward_crc_disabled": false,
    /* gps enable */
    "gps": true,
    "gps_tty_path": "/dev/ttyAMA0",
    "fake_gps": false,
    "ref_latitude": 10,
    "ref_longitude": 20,
    "ref_altitude": -1,
    "autoquit_threshold": 20
}
Save modified buffer? (Answering "No" will DISCARD changes.) [Y/N]
Y Yes
N No      ^C Cancel
```

Input “Y”:

```
"gateway_conf": {
    "gateway_ID": "0000000000000000",
    /* change with default server address/ports, or overwrite in local_conf.json */
    "server_address": "eu7udp.resiot.io",
    "serv_port_up": 7677,
    "serv_port_down": 7677,
    /* adjust the following parameters for your network */
    "keepalive_interval": 10,
    "stat_interval": 30,
    "push_timeout_ms": 100,
    /* forward only valid packets */
    "forward_crc_valid": true,
    "forward_crc_error": false,
    "forward_crc_disabled": false,
    /* gps enable */
    "gps": true,
    "gps_tty_path": "/dev/ttyAMA0",
    "fake_gps": false,
    "ref_latitude": 10,
    "ref_longitude": 20,
    "ref_altitude": -1,
    "autoquit_threshold": 20
}
File Name to Write: /opt/ttn-gateway/packet_forwarder/lora_pkt_fwd/global_conf.json [M-B] M-B Backup File
^G Get Help [M-D] M-D DOS Format [M-A] M-A Append
^C Cancel [M-M] M-M Mac Format [M-P] M-P Prepend
^T To Files
```

Finally, use “Enter” key to finish.

OK, let's check on RESIOT website:



The screenshot shows the RAKwireless LoRaWAN™ Gateways interface. In the main table, there is one entry for 'RAK7246 b827eb73045 b827ebffff873045'. The 'State' column shows a green circle with a checkmark, indicating a successful connection. The 'RSSI/RSRP(dBm)' value is 0. The 'Model' column shows 'IMST IC880a + Raspberry Pi'. The 'Modem Data Enabled' status is listed as 'Enabled'. Below the table, a log window titled 'Log Instant View' displays several log entries related to the connection, such as 'comm\_gwalive' and 'comm\_gwrx' messages.

Great! You can see the flag of the red box in the above picture, that means your RAK7246 has connected with RESIOT successfully.

## 8. Where is the source code of RAK7246?

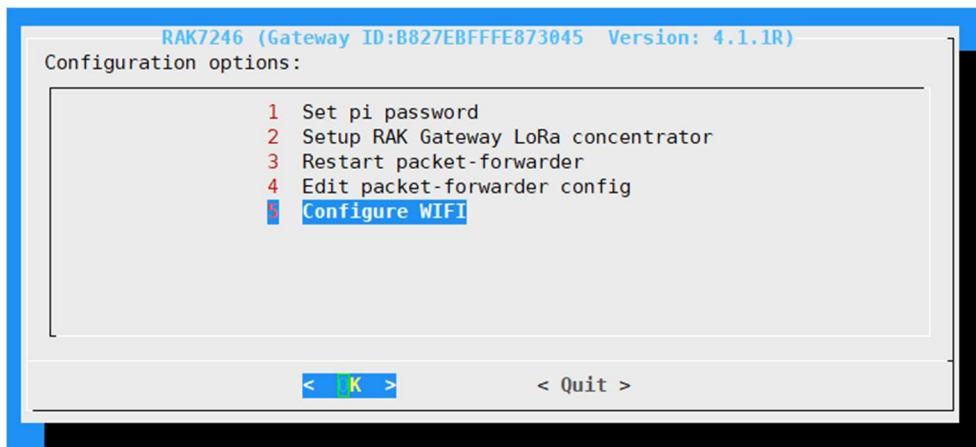
RAK supply a fully open source project for RAK7246 and you can find the source code on Github:

<https://github.com/RAKWireless/RAK7246>

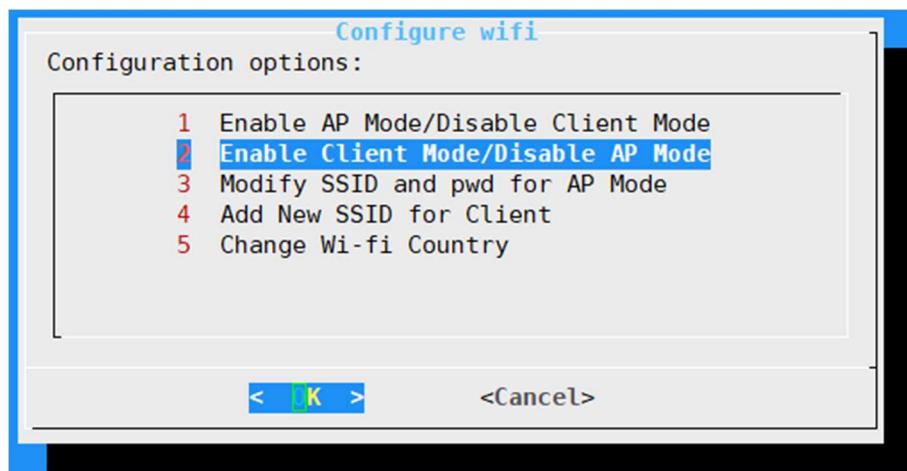
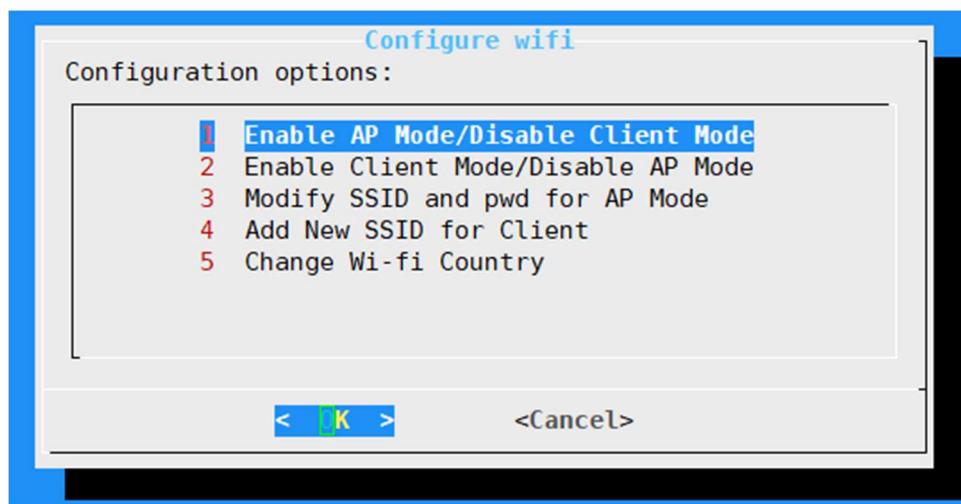
## 9. How to connect RAK7246 to a WiFi router

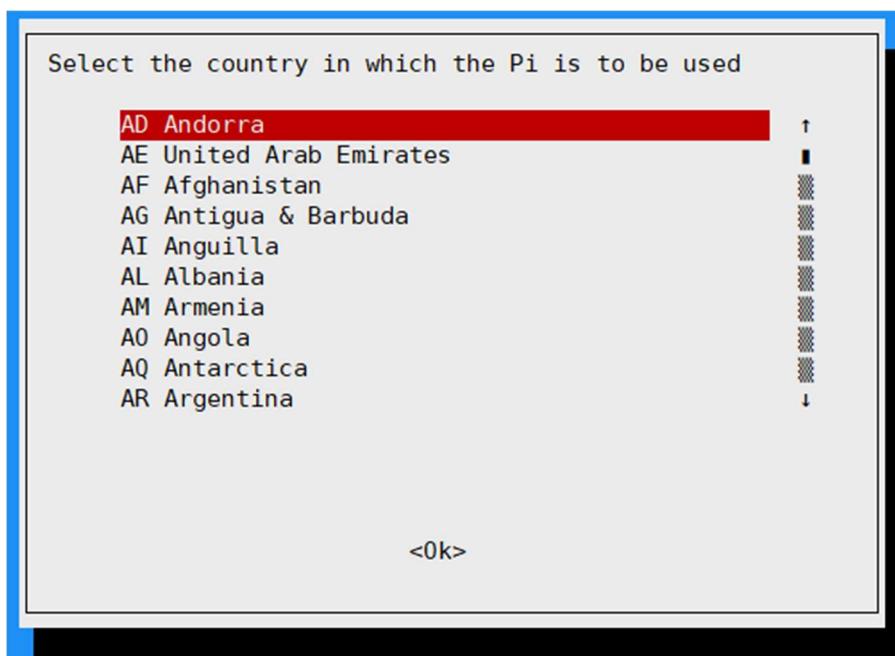
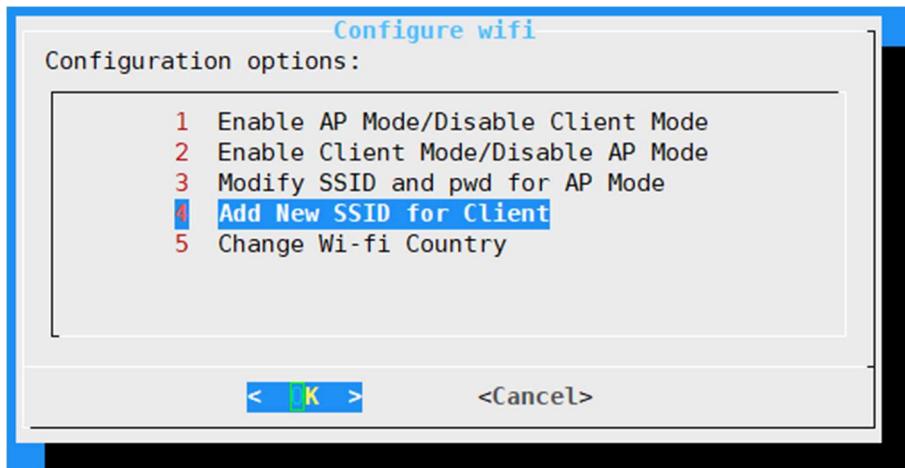
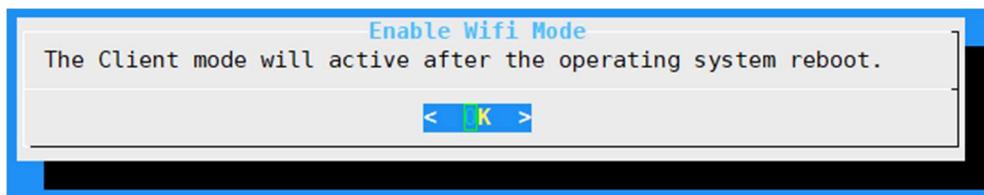
If you want your RAK7246 to access Internet so that it can communicate with an online LoRa Server like TTN, you need to connect your RAK7246 with a WiFi router firstly according to the following steps:

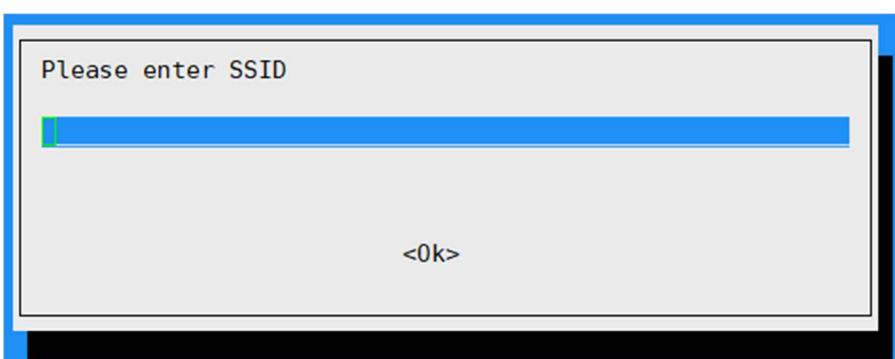
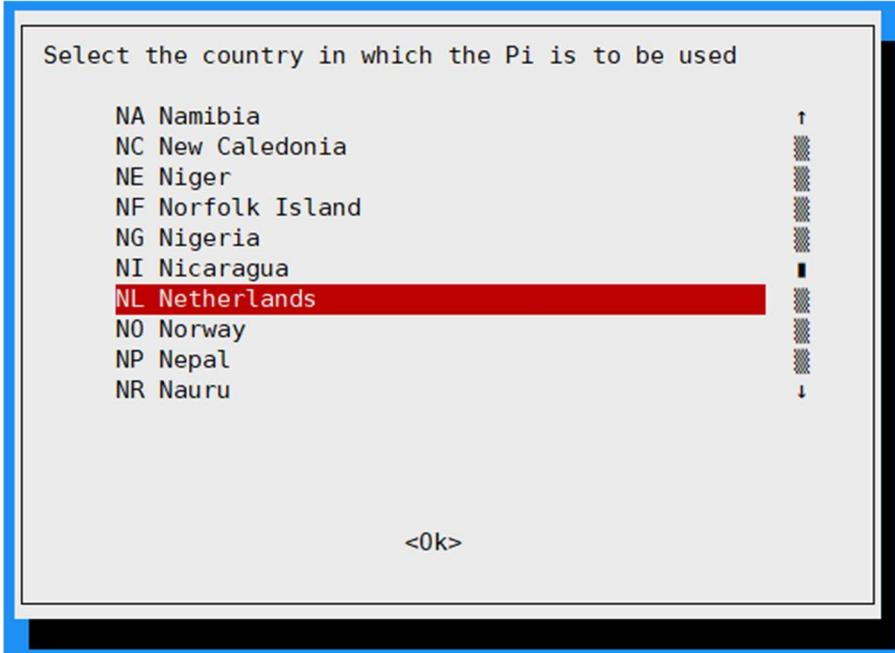
Choose “5 Configure WiFi”:

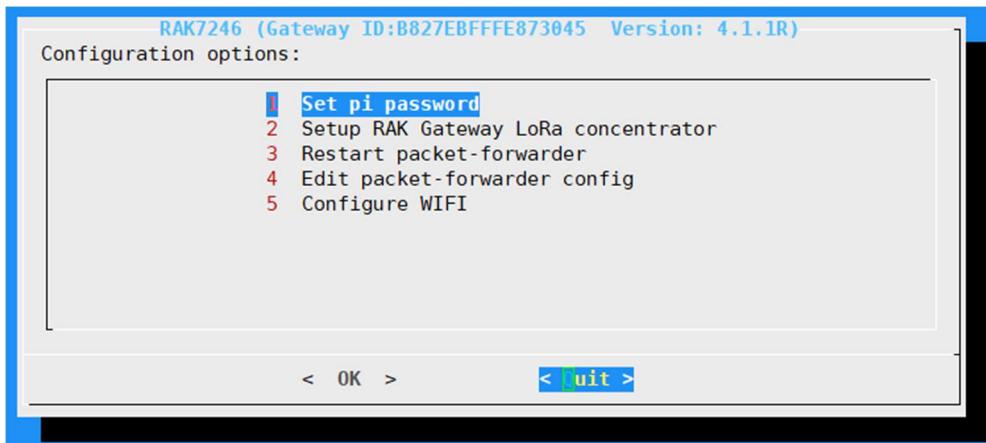
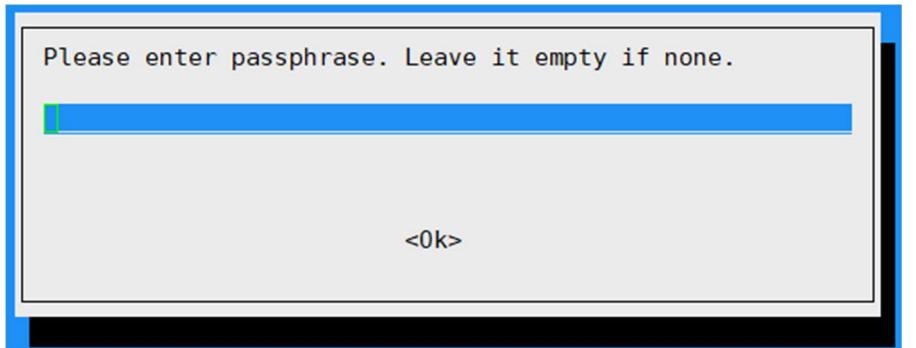


You will see the following page:









Finally, use “sudo reboot” to restart your RAK7246 and RAK7246 will connect the WiFi router automatically.

```
pi@RAK-873045:~ $  
pi@RAK-873045:~ $ sudo reboot
```

There may be some questions after you connect RAK7246 with a WiFi router:

## **9.1 How can I get the current IP address of RAK7246 when it connects successfully with the WiFi router?**

Usually, WiFi router will allocate a new IP address for RAK7246 through DHCP, but you don't know what's the current IP address of RAK7246.

In this case, maybe you need some tools like “fping” or “arp -a” to find the IP address according to the MAC address of RAK7246.

192.168.6.19	0c-96-e6-7d-c6-bd
192.168.6.21	0c-54-a5-17-7e-30
192.168.6.38	b8-27-eb-6c-d4-e7
192.168.6.45	b8-27-eb-d3-e7-9f
192.168.6.52	74-40-bb-48-09-b5
192.168.6.54	74-40-bb-d5-64-17
192.168.6.61	62-c5-a8-04-d3-e1
192.168.6.72	0c-96-e6-7d-70-19
192.168.6.91	b8-27-eb-89-10-59
192.168.6.92	5c-ff-ff-6f-bd-ba
192.168.6.108	9c-30-5b-ad-e4-65
192.168.6.120	74-40-bb-a4-69-bd
192.168.6.165	0c-96-e6-7d-86-75
192.168.6.169	18-d7-17-a2-7c-61
192.168.6.185	a8-9c-ed-62-05-07
192.168.6.186	ac-d5-64-a2-92-f9

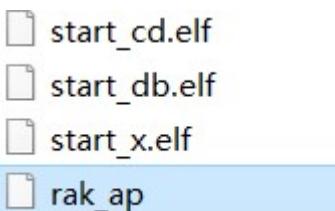
## 9.2 If RAK7246 fails to connect with the WiFi router, how can I control it?

Sometimes, RAK7246 fails to connect with the WiFi router after configuration and reboot, for example, the SSID or password is not correct. In this case, you want to login RAK7246 again through SSH to configure it again, but you find that you can't login it because there is no WiFi AP mode and it hasn't connected with any WiFi router now, in a word, you have lost it forever.

What you should do is just to insert the SD card into your PC through the card reader, and open the boot folder:



Then create a new file named "rak\_ap" in this folder:



Then insert the SD card into RAK7246 and power on again, RAK7246 will work in WiFi AP mode again, and you can login it according to the method we described in the section 4 and 5.

Please contact us if you need more technical support or want to know more information.

**Support center:** <https://forum.rakwireless.com/>

**Email us:** [info@rakwireless.com](mailto:info@rakwireless.com)

## 10. Revision History

Revision	Description	Date
1.0	Initial version	2020-01-15

## 11. Document Summary

Prepared by	Checked by	Approved by
Fomi		