

How To Connect LoRa RAK811 To LORIENT V1.0

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After update the new version, this document without prior notice.

1. Introduction

This document mainly gives a detailed introduction about how to connect RAK811(Lora) to LORIoT.

RAK811 Low-Power Long Range LoRa Technology Transceiver module, provides an easy to use, small size, low-power solution for long range wireless data transmission.

First, The RAK811 module complies with the latest LoRaWAN Class A & C protocol specifications, it is simple to access LWPA IOT platforms, such Actility etc. Second, it also support Lora Point to Point communications, this function can help customers implement their own private long range Lora network fast.

Module integrates semtech SX1276 and stm32L, offer user an serials At commands with UART Interface .It is easy to accomplish their applications, such as simple long range sensor data applications with external host MCU, low-power feature is suitable for battery applications.

I will introduce the following four parts in detail:

- (1)Registered Account;
- (2)Add Gateway to LORIoT;
- (3)Upgrade the Firmware of the Gateway;
- (4)Add RAK811 to LORIoT;

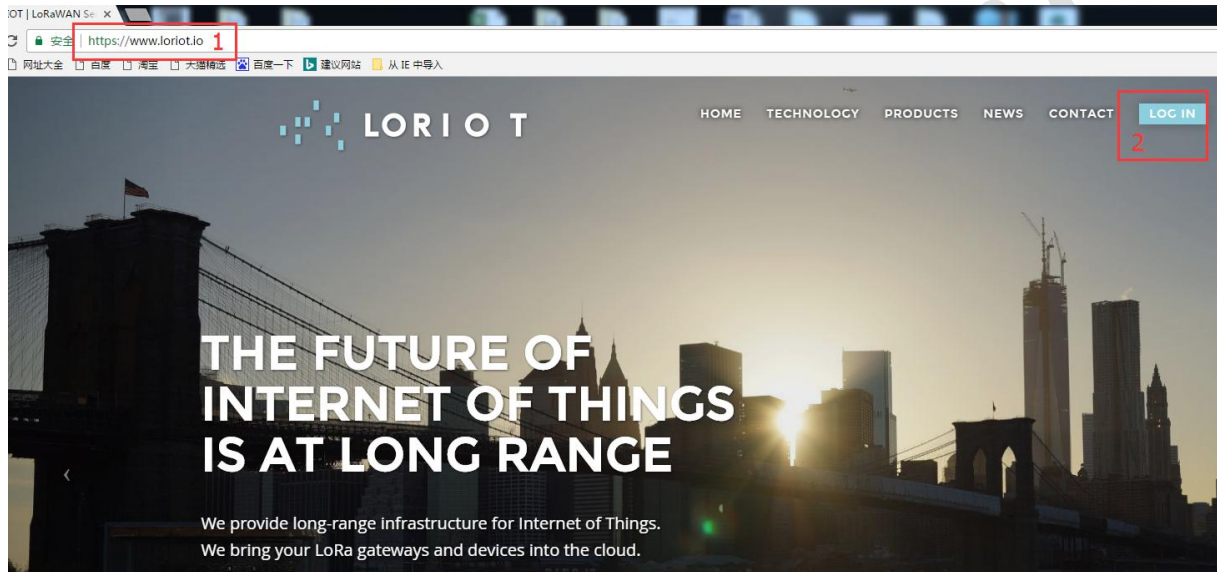
2. Registered Account

If you wanted connect the RAK811 to LORIIOT, you need to register an account on LORIIOT. Its website is <https://www.loriot.io/>. Now, please follow the step below to register.

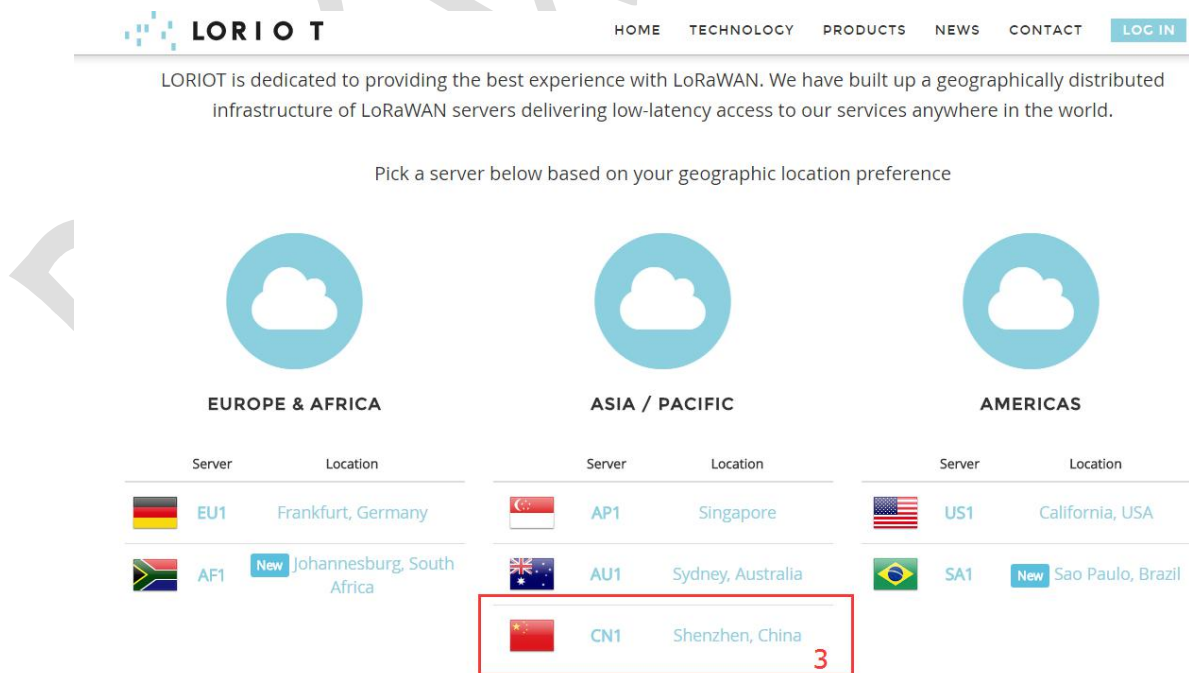
1. Please click the URL mentioned above, or copy and paste this URL and open with browser;

Step 1: Open this website;

Step 2: Click " LOG IN" ;



Step 3: Pick a server below based on your geographic location preference, at here I am choose "Shenzhen, China" and click;



Registration of a free [community account](#) is available on all servers.

Step 4: Click "Register" and starting to registration;

Login to Control Panel

Email
Email

Password
Password

Login

Don't have an account yet?
Register 4

Forgot your password?
Reset password

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Step 5: You will see a registration form, fill in the form as required. After filling,click “CREATE A FREE ACCOUNT” and complete registration;

HOME TECHNOLOGY PRODUCTS NEWS CONTACT [LOG IN](#)

ATION

REGISTRATION FORM

your LoRa
a end-nodes

Server location
CN1 | China

First name
First Name

Last name
Last Name

Country
Switzerland

E-mail
E-mail address

Password
Password

☒ I agree with [Terms of Service](#)

CREATE A FREE ACCOUNT

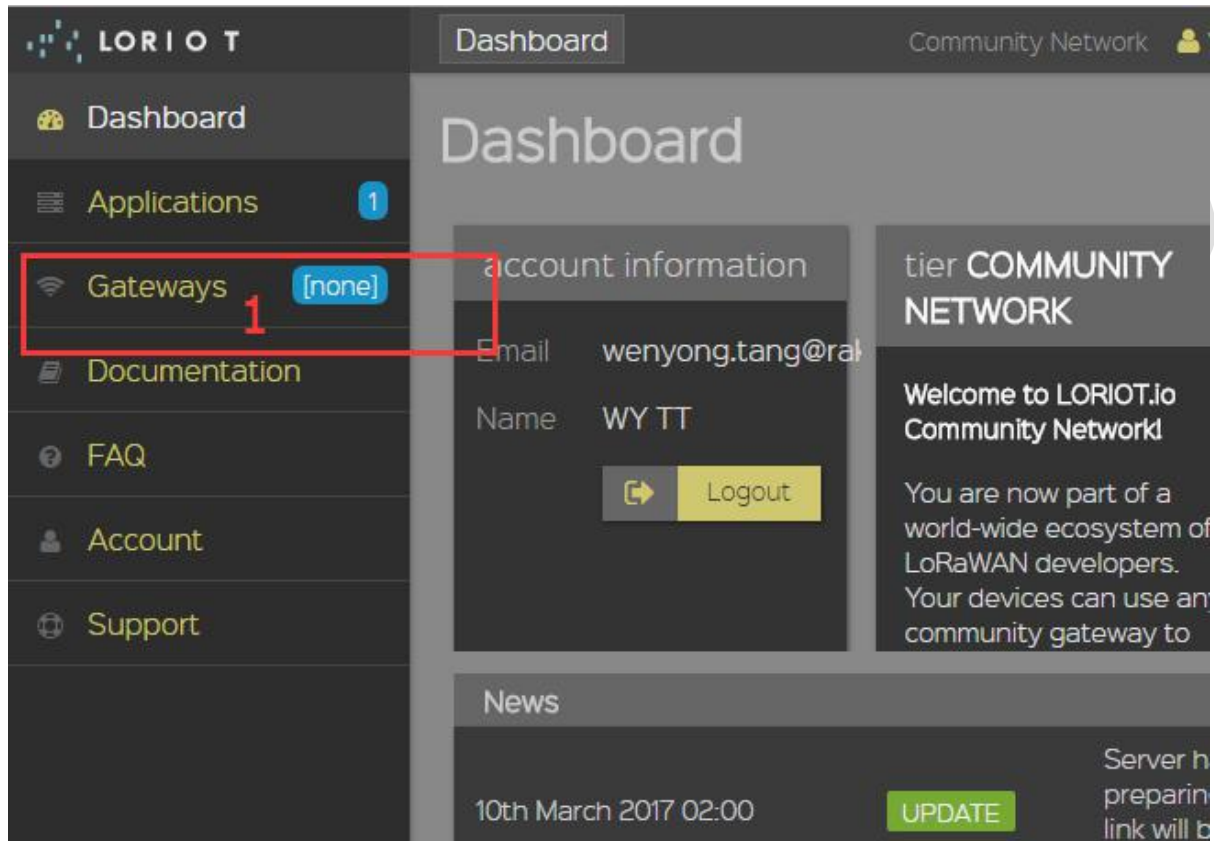
5

Step 6: Wating a moment you will received a email from LORIoT,it shown that you register account successfully.and click on the link in the email activate your account.

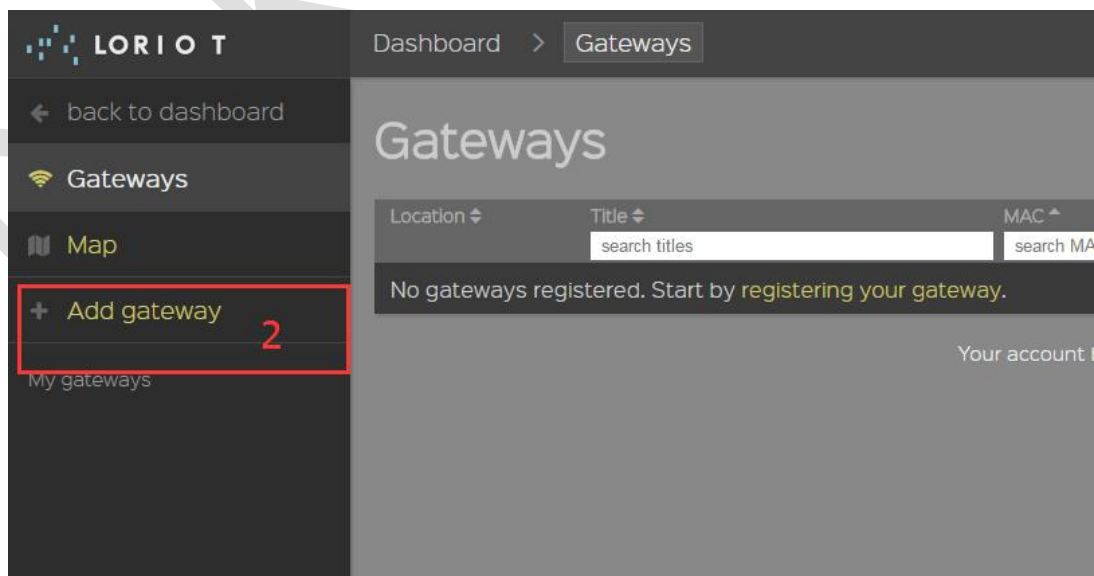
3. Add Gateway to LORIoT

Please log in to your account and follow the steps below, Here I use MultiTECH gateway device to demonstrate:

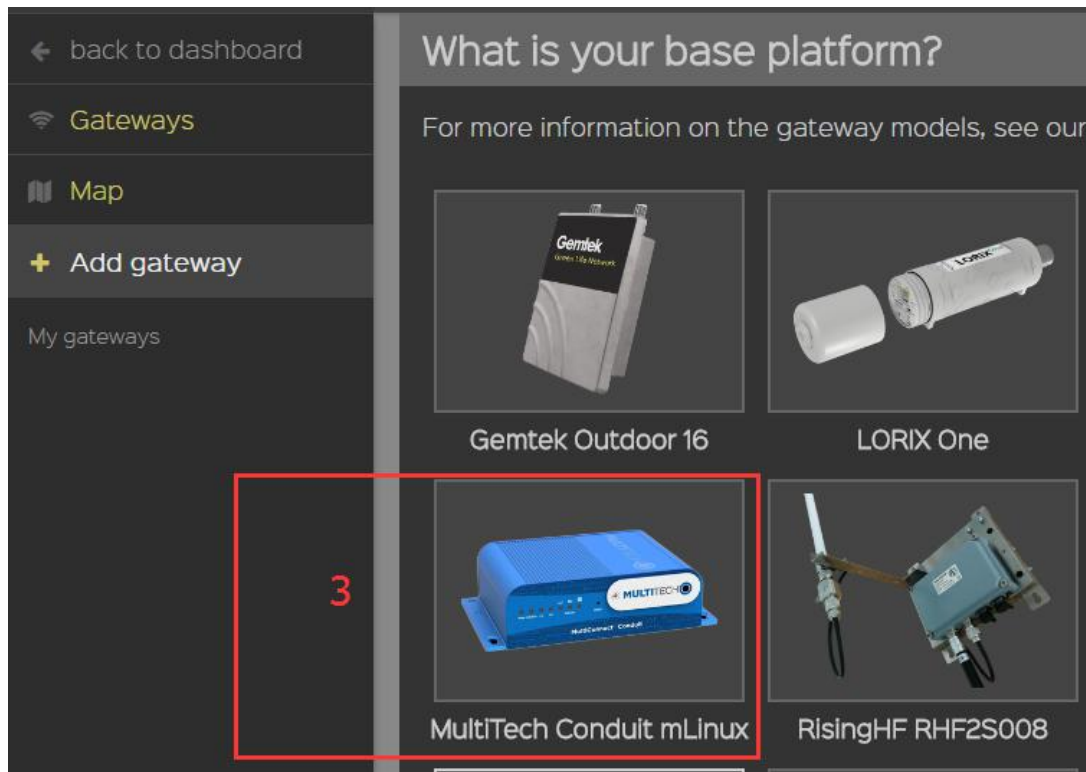
Step 1: Log in your account, Click "Home" , Go to your Dashboard, then click "Gateways" ;



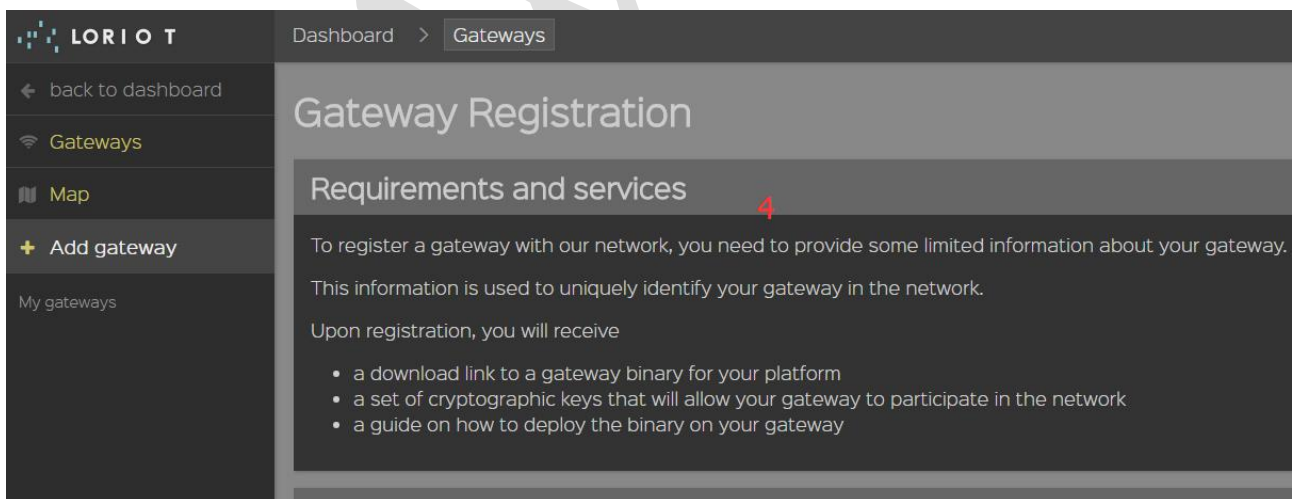
Step 2: Click "Add gateway" ;



Step 3: Choose the gateway what you used;



Step 4: According to the actual situation of the gateway equipment information, like "Card", "eth0 MAC address", "Gateway location" ;



Step 5: Click “Register MultiTech Conduit mLinux gateway” , finish register;

Gateway location

To provide all users with a reasonable view of the coverage of the network, please provide
When displayed to other users, the location will be offset by a random value to protect yo

Country

地址

国家 中国

重要提示：此处需填入繁体或简体中文地址，请勿使用英语或拼音。范例：
深圳市南山中心区文心五路85号闽泰大厦B区1401A-16

That's it.

Register MultiTech Conduit mLinux gateway **5**

Step 6: After step 5, we have completed the addition of the gateway, but it is still in an inactive state. In the next chapter, I'll show you how to update the firmware of the gateway to activate it.

LORION T

back to dashboard

Gateways

Map

Gateway capacity exhausted

My gateways

Dashboard > Gateways

Community Network

Gateways

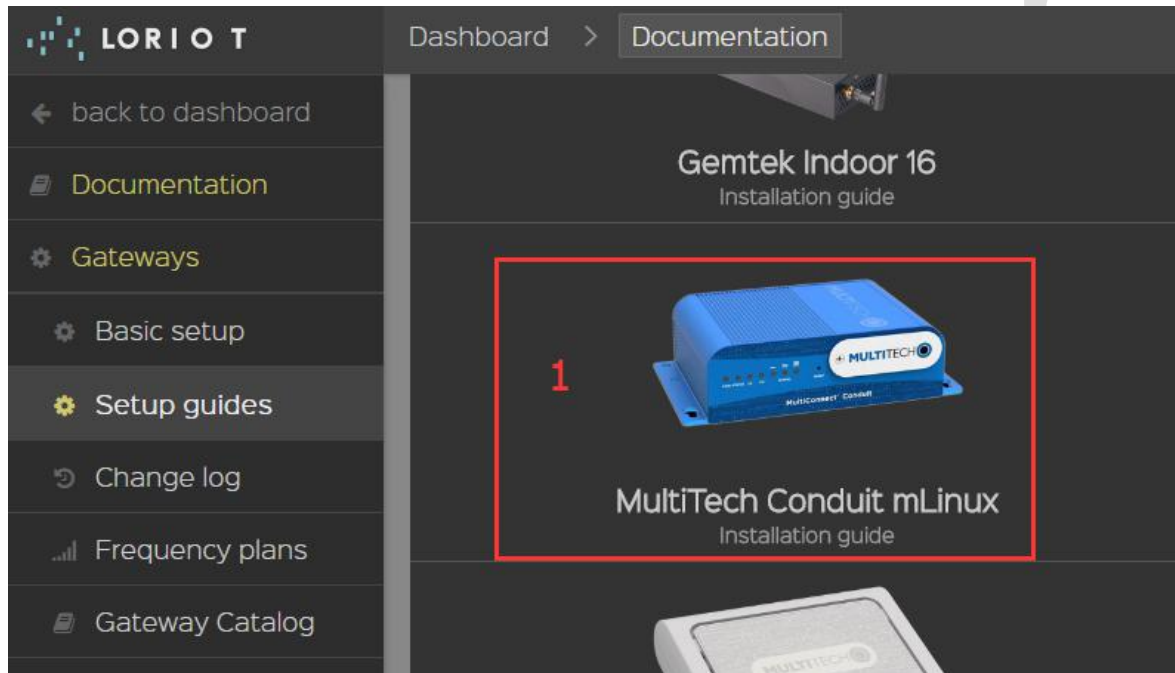
Location	Title	MAC	Model	Channel plan	Last data	Version	Alerts	Online
undefined	00:00:00:00:00:00	00:00:00:00:00:00	MultiTech Conduit mLinux	EU868_Semtech	never	0.1a	6	

Your account has capacity of 1 gateway. You can add more gateways by upgrading to [commercial account](#)

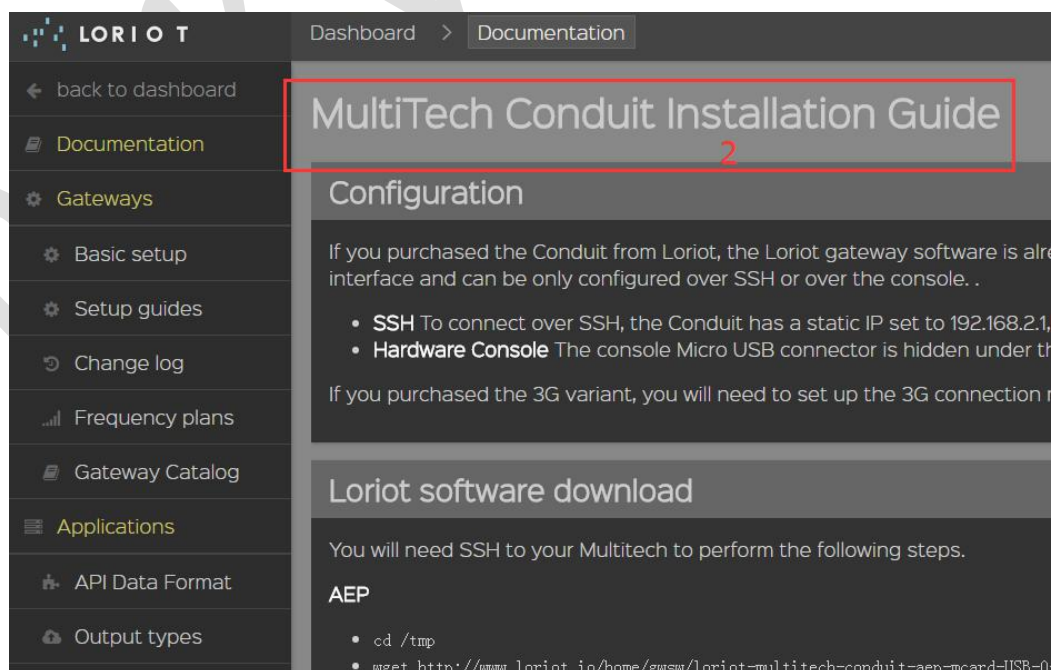
4. Upgrade the Firmware of the Gateway

To activate our gateway, to LORIoT, we need to download the firmware and flash the gateway. But how to set our gateway?

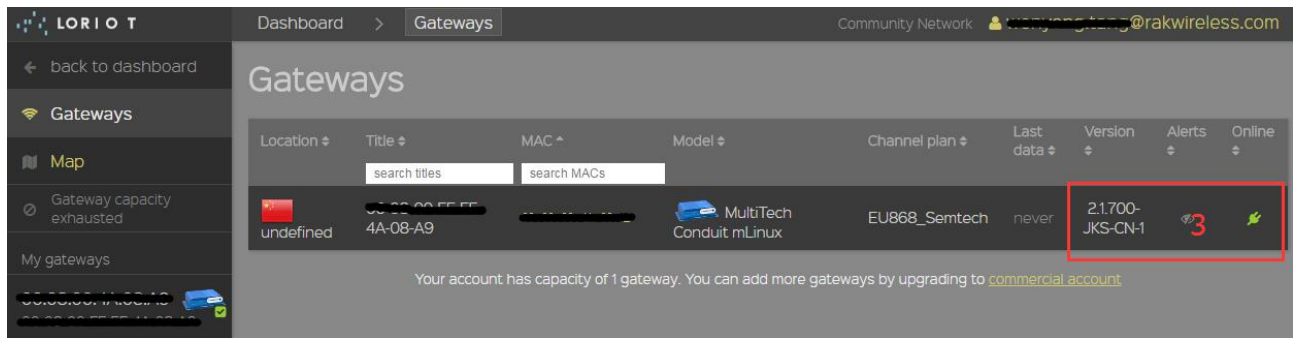
Step 1: Open "Dashboard" - "Documentation" - "Setup guides", select the appropriate installation guide based on your own gateway model and click on;




Step 2: Complete the firmware upgrade according to installation guide;



Step 3: Refresh Gateways page, You can see that the gateway is already active;



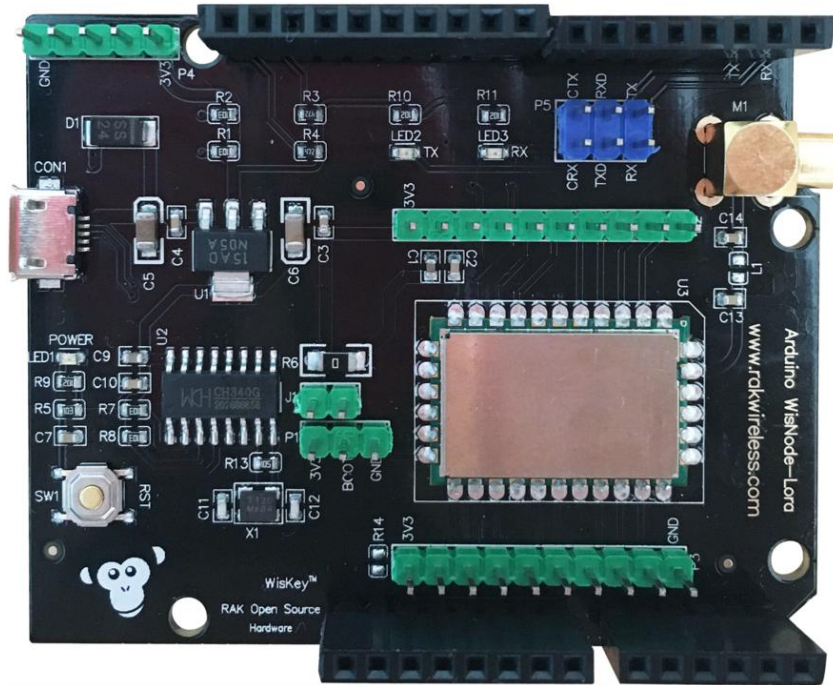
The screenshot shows the 'Gateways' page in the RAK Loriot dashboard. The interface includes a sidebar with navigation options like 'back to dashboard', 'Gateways', 'Map', and 'My gateways'. The main content area displays a table of gateways. A single gateway is listed with the following details:

Location	Title	MAC	Model	Channel plan	Last data	Version	Alerts	Online
undefined	4A-08-A9	[redacted]	MultiTech Conduit mLinux	EU868_Semtech	never	2.1.700-JKS-CN-1	3	

A red box highlights the 'Version', 'Alerts', and 'Online' columns for this gateway. Below the table, a message states: 'Your account has capacity of 1 gateway. You can add more gateways by upgrading to [commercial account](#)'.

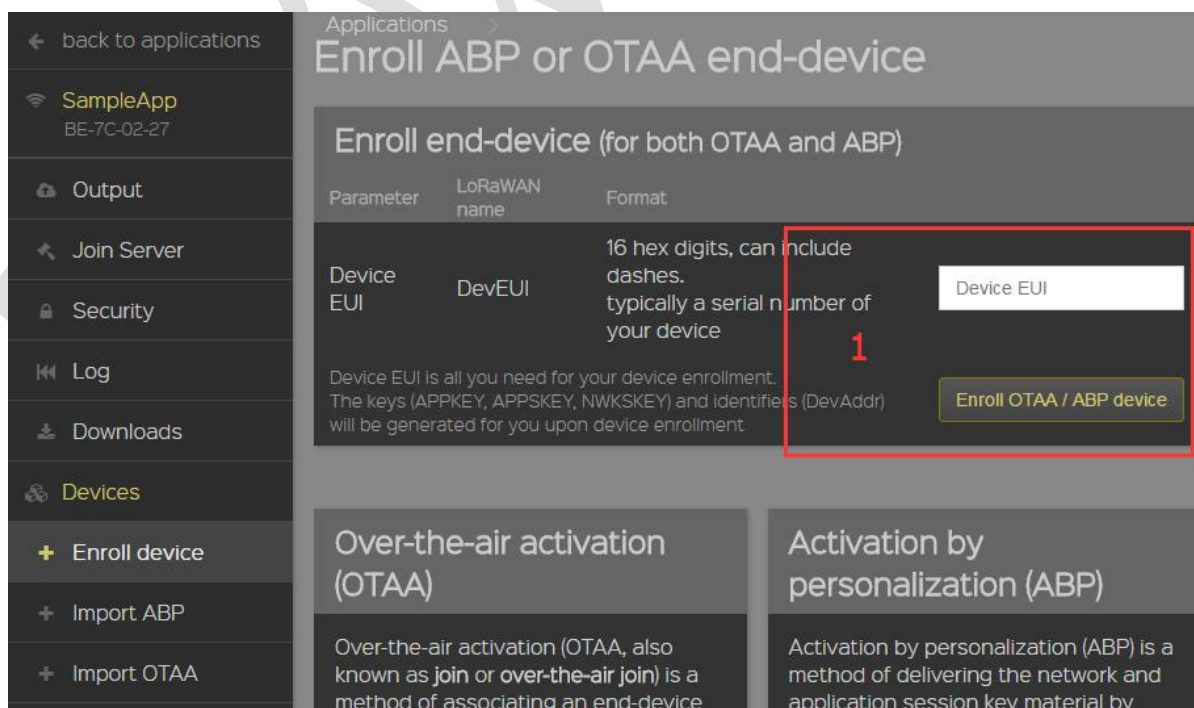
5. Add RAK811 to LORIoT

In this part, I will use WisNode-Lora EVB to demonstrate how to add our LoRa RAK811 module to LORIoT;



RAK WisNode-Lora EVB

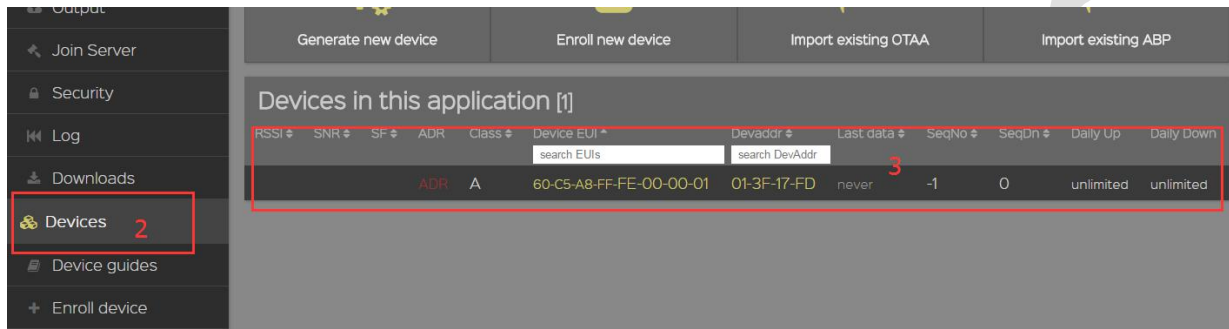
Step 1: Open "DashBoard" - "Applications" - "SampleApp" - "Enroll device", then fill in "Device EUI", and click on "Enroll OTAA/ABP device", start to add RAK811 Lora module.



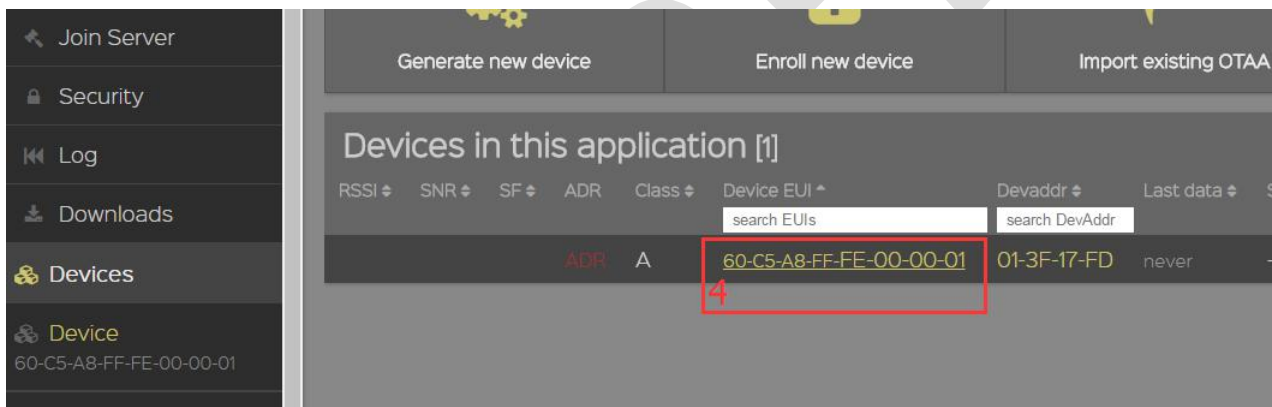
Device EUI: Enter the DevEUI for your device. This ID should come with the information included with your device, or can be found in the device use at+get_config=dev_eui.

Step 2: Click on "Device" ;

Step 3: We have completed the add the RAK811 Lora module, but it is still in an inactive state ;



Step 4: Click on "Device EUI" ;




Step 5: On the page you will see the information about RAK811 LoRa module, like DevAddr, AppKey, NwkSkey, AppSKey;

Step 6: Use Micro USB interface to supply the module power. One end of the serial line is connected to the module, and one end is connected to the computer. Then open the Uart AssistTool, send AT command to operate the module.

Device 60-C5-A8-FF-FE-00-00-01

EUI 60C5A8FFFE000001 big endian (use by default)
 010000FEFFA8C560 little endian (for LoRaWAN non-compliant devices)

 Remove device

DevAddr 013F17FD big endian (use by default)
 FD173F01 little endian (for LoRaWAN non-compliant devices)

NOTE: Use big endian representation by default. Only use the little endian value when suspecting problems.
 See the [device guides](#) for personalized, device specific configuration commands

5

LoRaWAN AES128 Keys

AppKey CBF9C9F246AB4CD8574BA3B3E0E8362A
 Application Key (Device If you want to enable over-the-air join, add or derive the device's Key) application key.

NwksKey 4CAD9901FEB8F6801D0C3BE1E9DD76D1
 Network Session Key

AppSKey F39F38D314EC5DCB0F6D55ED734F2F98
 Application Session Key

Step 7: Send the AT command to the module in the following order, make the RAK811 module join the abp;

Boot information : Welcome to RAK811

Send: at+mode=0 /* SET LoraWAN work mode */

Return: OK

Send:at+set_config=dev_eui:60C5A8FFFE000001 /* GET Dev_EUI check if NULL ,set the enter before information */

Return: OK

Send:

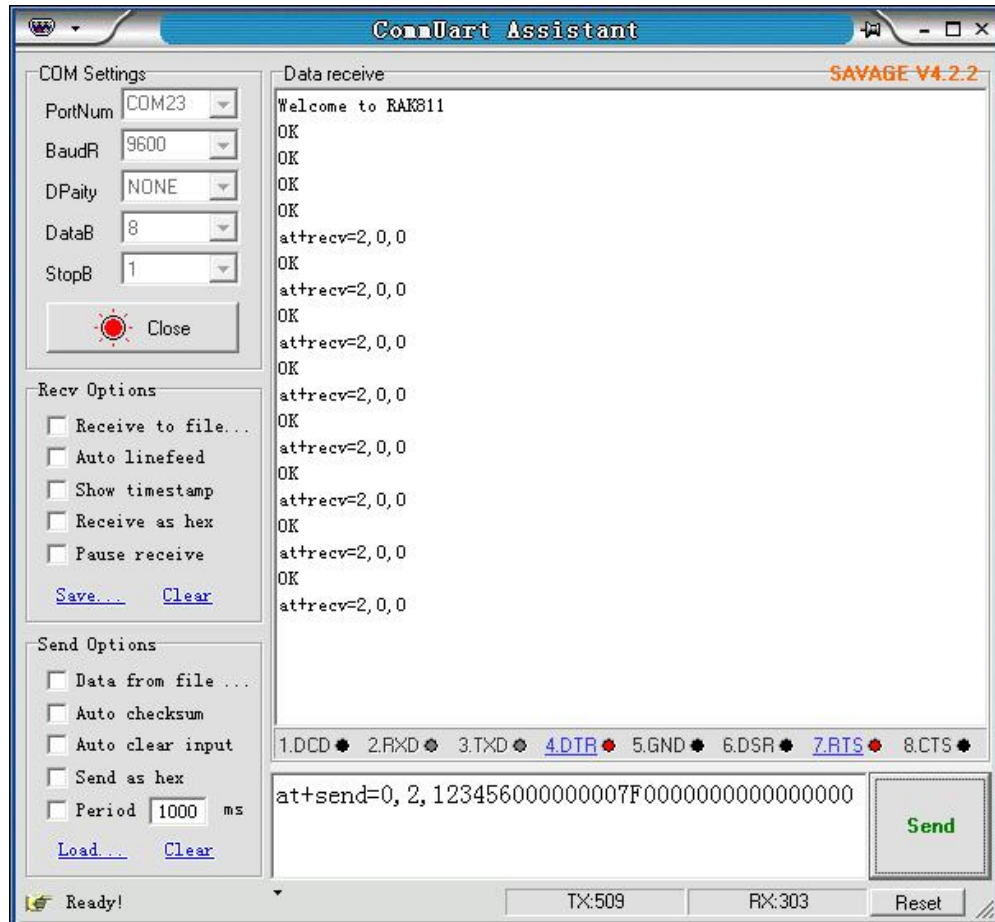
at+set_config=dev_addr:013F17FD&nwks_key:4CAD9901FEB8F6801D0C3BE1E9DD76D1
&apps_key:F39F38D314EC5DCB0F6D55ED734F2F98

/* SET LoraGateway dev_addr nwks_key and apps_key , big endian*/

Return: OK

Send: at+join=abp /* Join abp type*/

Return: OK



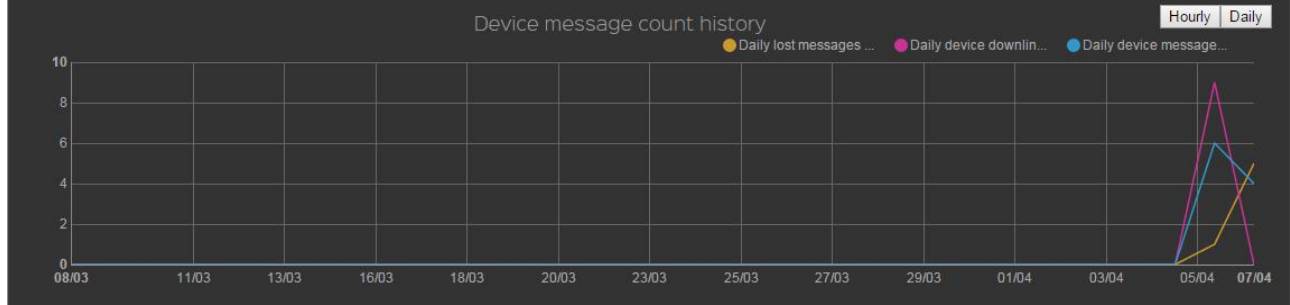
Step 8: After join abp, then can use the following AT command send data to LORIoT, then refresh dashboard page, we can see our Device is Active, it means our module connect with LORIoT;

Send: `at+send=0,2,00000000000000007F0000000000000000`

Return: `at+recv=2,0,0` /*unconfirmed mean tx success*/

	RSSI	SNR	SF	ADR	Class	Device EUI	DevAddr	Last data	SeqNo	SeqDn	Daily Up	Daily Down
						search EUIs	search DevAddr					
	-37	10	12	ADR	A	60-C5-A8-FF-FE-00-00-01	01-3F-17-FD	10 minutes ago	8	0	unlimited	unlimited

Traffic history



[← back to applications](#)

SampleApp
BE-7C-02-27

Output

Join Server

Security

Log

Downloads

Devices

Device
60-C5-A8-EE-EE-00-00-01

Last data (10 latest records)

SeqNo	Time	Port	Data
8	19 minutes	2	12 34 56 00 00...
7	30 minutes	2	01 01 01 00 00...
4	35 minutes	2	00 00 00 00 00...
2	36 minutes	2	00 00 00 00 00...
6	a day	2	01 55 00 00 00...
5	a day	2	01 51 00 00 00...
4	a day	2	01 11 00 00 00...

6. Modify Record

Version	Author	Data	Modify content
V1.0	Wenyong.tang	2017/04/07	Create Document