5205-WisTrio-LoRa node

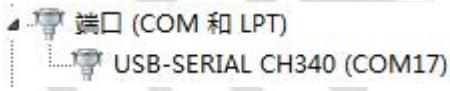
User Manual V1.0

1. Burning Program with Serial Port

1.1 Installation of Serial Driver

This device uses USB to switch to serial chip CP2102, so when the device is connected to the computer, it usually installs the driver automatically. If you find that the computer does not have the driver automatically, please download the driver from the following link:

Http://passport.rakwireless.com/stat/en/RAK811%20TrackerBoard/Tool/CP210x_Windows_Drivers.zip



1.2 start and upgrade

This device supports the use of serial BOOT burning, which requires the use of BOOT0 pins.

Connect BOOT0 with VDD using jumper cap, the device will enter BOOT mode, and then use Flash Loader Demonstrator, the official upgrade tool of ST, to record bin files for firmware burning.

For burning tools and firmware, please refer to the download link:

Https://github.com/RAKWireless/RAK5205-WisTrio-LoRa.git

The steps are as follows:

1.Open the Flash Loader Demonstrator tool, Set the serial port parameters;

2.Click the "NEXT" button, arrive the following interface;

The again the "Next" button, Choose STM32L1_Cat2-128K;

4.Choose "Download to device", Set the path to the new firmware, and click "NEXT" button.

5.Upgrading:

6.Upgrade Successful.

Note: Upgrade is completed, please unplug the jumper cap on BOOT0 and VDD to make the application code run normally.

1.3 Connecting Serial Port Tool

Connect the 5205-WisTrio-LoRa node to the computer serial port tool (the serial port tool we use here is sscom5), select the corresponding serial port and baud rate.

2.Configuration Command Brief

command	describe
at+region[:<Value>]	Get/set the LoraWAN 1.0.2 range
at+set_config=<key>:<value>[&<key>:<value>][&<key>:<value>]…	Set up the LoraWAN configuration, Keys as follows:dev_addr, dev_eui, app_eui, app_key, nwks_key, apps_key, pwr_level, adr, dr, public_net, rx_delay1, rx2, ch_list, ch_mask, max_chs, join_cnt, nbtrans, class, duty
at+ps[:<mode>]	Get/Set the working power supply mode of the module, default is 0 0:USB Power Supply Mode 1: Battery power supply mode
at+gps_stime[:<dr>]	Detecting GPS Time
at+app_interval[:<dr>]	Delivery interval length
at+msg_confirm[:<type>]	Send data to LoraWAN network< type >

	0: Send unacknowledged packages 1: Send acknowledged packages
at+join_mode[:<mode>]	Join the configured LoraWAN network Otaa: aerial activation Abp: personalized activation
at+run	Skip wait

```
[16:25:57.957]收←◆RAK5205_TrackerBoard software version:2.0.0.0
LIS3DH init success!
ACC X:0mg Y:-16mg Z:0mg
BME680 init success!

[16:25:58.307]收←◆T: 32.08 degC, P: 977.16 hPa, H 9.47 %rH , G: 19884 ohms
Please Configurate parameters...

[16:26:32.460]发→◇at+region:US915
□
[16:26:34.880]收←◆OK

[16:26:43.901]发→◇at+set_config=dev_eui:00B7E4210E8B6406
□
[16:26:46.319]收←◆OK

[16:26:46.997]发→◇at+set_config=app_eui:70B3D57ED0014FC1
□
[16:26:49.415]收←◆OK

[16:26:50.053]发→◇at+set_config=app_key:89F37A7C71E35468E3A4D20807E996D8
□
[16:26:52.474]收←◆OK


[16:27:37.533]发→◇at+ps:0
□
[16:27:39.952]收←◆OK

[16:28:04.557]发→◇at+gps_stime:180
□
[16:28:06.977]收←◆OK
```

Using 915 Frequency Node

Set three parameters

USB power supply

GPS Detection Time Setting

```
[16:28:23.717]发→◇at+app_interval:10
□
[16:28:26.135]收←◆OK

[16:28:34.884]发→◇at+msg_confirm:0
□
[16:28:37.301]收←◆OK
```

Send Interval Settings

Recovery mode settings

```
[16:29:41.687]发→◇at+join_mode:abp
□
[16:29:44.105]收←◆OK
```

Abp mode settings

```
[16:30:05.916]发→◇at+run
□
[16:30:05.922]收←◆Configuration OK!
app_interval = 10
gps_stime = 180
msg_confirm = 0
power_save = 1
Selected LoraWAN 1.0.2 Region: US915

[16:30:05.986]收←◆Board Initialization OK!

OTAA mode:
DevEui: 00B7E4210E8B6406
AppEui: 70B3D57ED0014FC1
AppKey: 89F37A7C71E35468E3A4D20807E996D8
OTAA Join Start...

[16:30:06.053]收←◆ACC X:0mg Y:0mg Z:0mg
```

Skip wait

All parameter settings, please complete before this prompt appears, after setting parameters will appear error prompt.

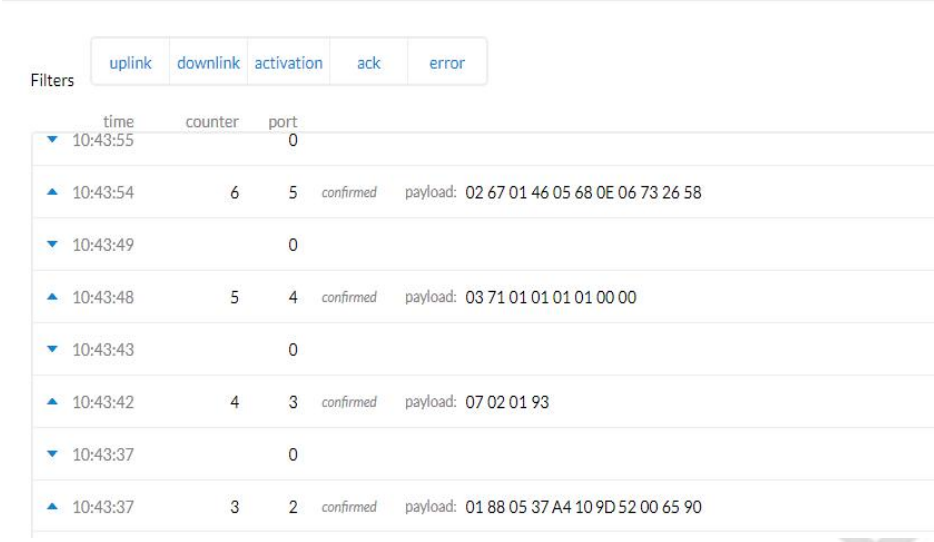
3. Check the TTN connection information of RAK811

Once "join otaa" succeeds, it automatically sends data to TTN. Log in to TTN and select "gateway Traffic", where we can see that our module is successfully sending data to TTN.

```
[10:41:35.797]收←◆Configuration OK!
app_interval = 5
gps_stime = 180
msg_confirm = 1
power_save = 1
Selected LoraWAN 1.0.2 Region: US915

[10:41:35.864]收←◆Board Initialization OK!

OTAA mode:
DevEui: 00B7E4210E8B6406
AppEui: 70B3D57ED0014FC1
AppKey: 89F37A7C71E35468E3A4D20807E996D8
OTAA Join Start...

[10:42:55.607]收←◆OTAA Join Success!

[10:43:00.615]收←◆latitude: 34.193061, longitude: 108.885903 , altitudeGps: 470

[10:43:04.903]收←◆Bat: 4170mv

[10:43:09.037]收←◆ACC X:-16mg Y:-16mg Z:0mg

[10:43:13.942]收←◆T: 32.60 degC, P: 981.67 hPa, H 7.26 %rH , G: 29089 ohms
```

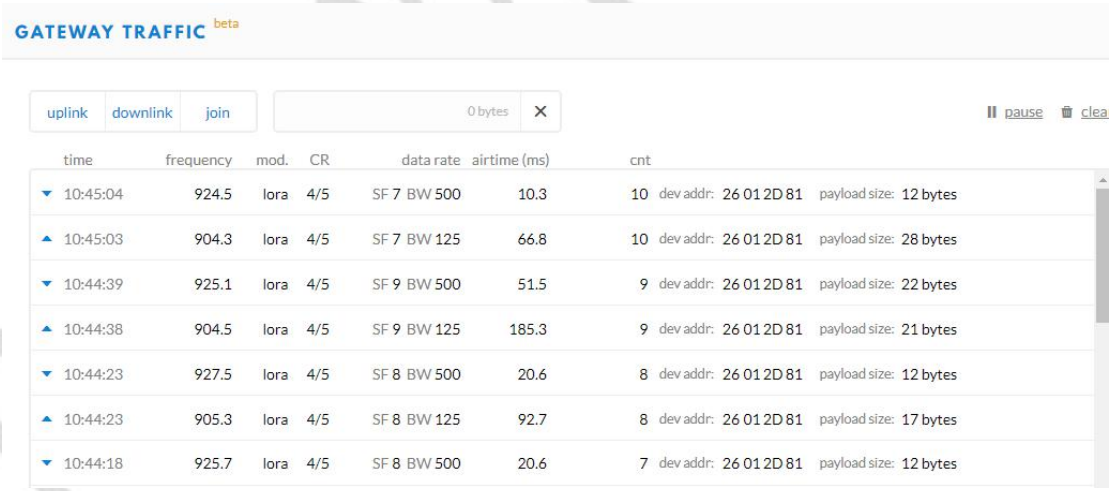
3.1 node data

As shown in the figure below, click on the data to see the specific node data.



3.2gateway data

As shown in the figure below, you can click on the gateway to see the specific gateway data information.



4. Parameter Description:

1. otaa/abp: Select the activation mode of access network

2.Device EUI/Application EUI/Application Key is the OTAA access parameter. Effective only in OTAA mode

3. Device Address/Network Session Key/Application Session Key is an ABP entry parameter and only works in ABP mode.

4. Region: LoRaWAN band (by region)

5. Message Confirm: Does the LoRaWAN message need an ACK response? (If ACK message is not received after opening, it will be automatically retransmitted)

6. Data interval: Sensor data acquisition and transmission interval in seconds

7. Power Save Mode: Turn on low power mode.

8. GPS Wait time: GPS positioning time-out in low power mode. In this time, if GPS does not locate successfully, the acquisition and transmission of GPS data will be abandoned.

5. Contact information

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6. Modify Record

Version	Author	Date	Modify content
V1.0	Nicholas	2018/12/14	Create Document