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How To Connect LoRa RAK811 To KotahiNet V1.0

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1. Overview

1.1 LPWAN

KotahiNet’ s initial focus is on the low power, long range segment. Technically, this is called LPWAN (Low-Power Wide-Area Networks). New Zealand can greatly benefit from ubiquitous, low cost connectivity ideally suited to the Internet of Things.LPWAN solutions are largely complementary to existing connectivity options such as cellular, wifi, and a large number of low power/low range technologies.

1.2 LoRaWAN

The best open specifications network model currently available globally is from theLoRa Alliance, called LoRaWAN (Long-Range Wide-Area Networks). Members of the LoRa Alliance include IBM, Cisco, Actility, and a number of leading telcos including Swisscom, KPN, SK Telecom, Bouygues, Proximus, and FastNet.

LoRaWAN networks are being rolled out in many countries. KotahiNet brings this leading technology to New Zealand.

1.3 RAK811 WisNode-LoRa

Top three reasons why we like the RAK811 WisNode-LoRa:

1. Low cost
2. Works both standalone as well as an Arduino shield
3. Easy to start with AT commands as well as extend withopen source code for IAR Embedded Workbench for ARM (EWARM) toolchain V7.70.1 + SWD

RAK WisNode-Lora EVB

2. Operation Steps

2.1 Quick Start

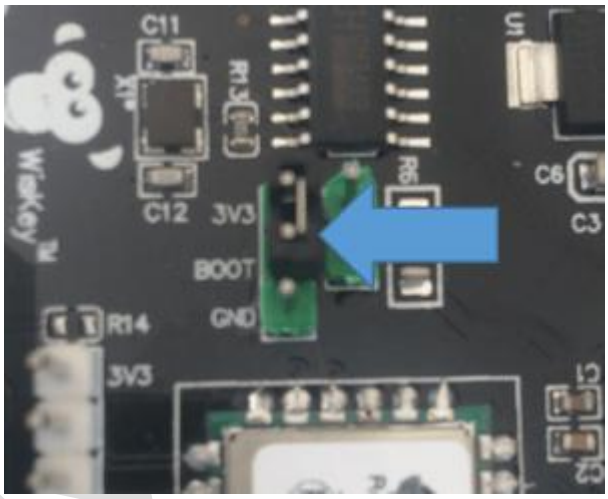
Before you start, contact KotahiNet for a free network connection. We will send ABP (Activation By Personalisation) details you need to enter into the code. Remember to check there is network coverage in your area.

2.2 Flashing

1. Download and save updated firmware.

2. Download and install STM32 flashing tool. Requires free registration or providing name and email address to STMicroelectronics.

3. Put the board in flashing mode by placing the supplied sleeve so as to bridge the pins 3V3 and BOOT.



Putting WisNode in flash mode

4. Connect the board to your computer with a USB cable. It should set up automatically on a COM port.

5. Flash the firmware following instructions on pages 5-7 of the Quick Start Guide.

6. Disconnect board from your computer.

2.3 Configure & Send Data

1. Set board to normal mode by placing the supplied sleeve so as to bridge the pins BOOT and GND.

2. Connect the board to your computer with a USB cable again.

3. Use a terminal emulator tool such as Tera Term or PuTTY and connect to the COM port. In Terminal Setup set new-line receive and transmit as CR+LF. Also select local echo. For serial port settings, leave all as default other than setting Baud rate to 115200.

4. Configure the board as below and send data.

IMPORTANT: Change the dev_addr (Device Address), nwks_key (Network Session Key), and apps_key (Application Session Key) in the configuration below to that provided by KotahiNet. Data sent will be visible on a web page. KotahiNet will provide the details about this when providing your ABP details.

Tip: It may be easier to copy and paste the ABP parameters and configuration for channels into the terminal, one line at a time. Typically, pasting is by right mouse button click.

```
at+version

OK1.0.2.3.5

at+set_config=dev_addr:014D066B

OK

at+set_config=nwks_key:405DD9F2F66300825D80BF2D2E44CA80

OK

at+set_config=apps_key:D4F0B91AC3D50A8B25412E1FCC8AB361

OK

at+join=abp

OK
```

```
at+set_config=ch_list:0,on,865000000,0,5

OK

at+set_config=ch_list:1,on,865200000,0,5

OK

at+set_config=ch_list:2,on,865400000,0,5

OK

at+set_config=ch_list:3,on,866200000,0,5

OK

at+set_config=ch_list:4,on,866400000,0,5

OK

at+set_config=ch_list:5,on,866600000,0,5

OK

at+set_config=ch_list:6,on,866800000,0,5

OK

at+set_config=ch_list:7,on,867000000,0,5

OK

at+set_config=rx2:867200000,0

OK

at+set_config=duty:off

OK

at+get_config=ch_list
```

OK0,on,865000000,0,5;1,on,865200000,0,5;2,on,865400000,0,5;3,on,866200000,0,5;4,on,866400000,0,5;5,on,866600000,0,5;6,on,866800000,0,5;
7,on,867000000,0,5;8,off;9,off;10,off;11,off;12,off;13,off;14,off;15,off

// send data- confirmed transmission, port, hex data
at+send=1,7,ABC123

OK

at+recv=1,0,0

// send data- unconfirmed transmission, port, hex data
at+send=0,7,ABC124

OK

at+recv=2,0,0

3. Modify Record

Version	Author	Data	Modify content
V1.0	Wenyong.tang	2017/04/25	Create Document