WisNode-Lora
Quick Start Guide V1.3

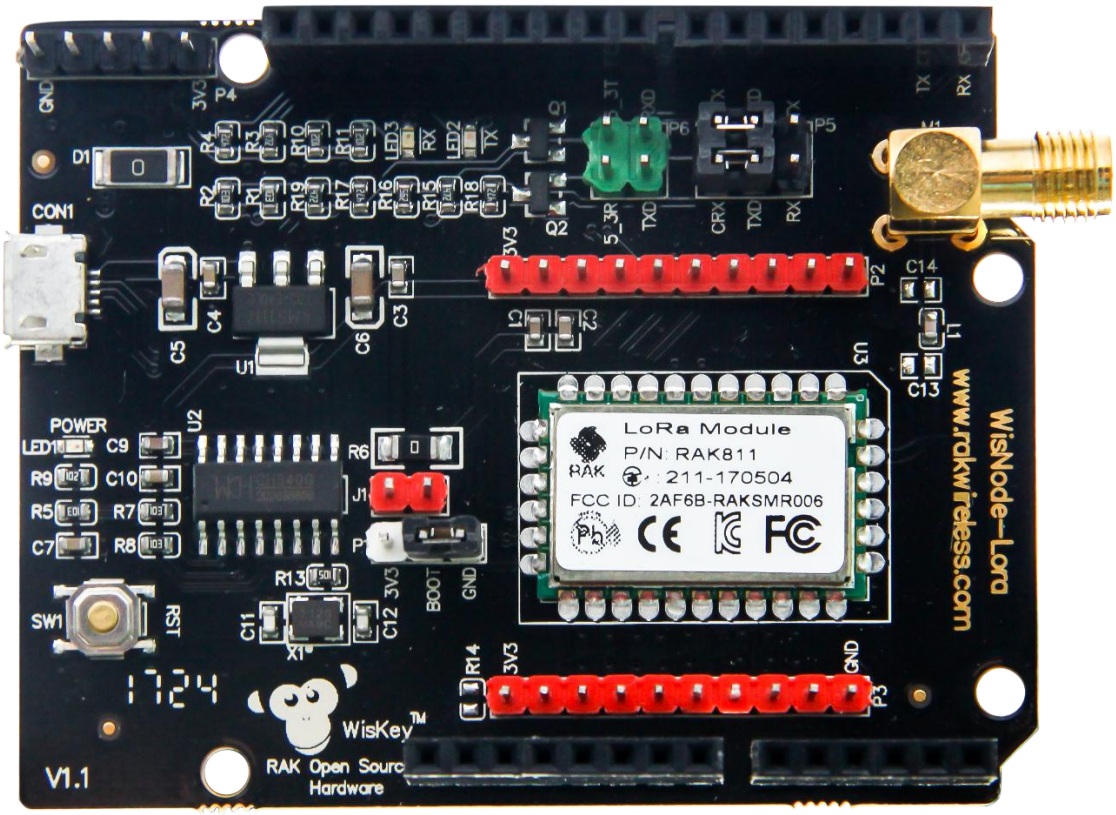
Shenzhen Rakwireless Technology Co., Ltd

www.rakwireless.com

info@rakwireless.com

1. General Description

The following image is RAK WisNode-Lora development board，and it compatible Arduino development board, It also can be used as an extension board development with Arduino. The interface resource are as follow：



Function	Name	Description
Module	U3	RAK811 Lora module
External Interface	CON1/Micro USB	Power Supply;DC 5V Input/USB to TTL communication interface
Key	SW1/RST	Module Reset Key
Leading Foot	P1	BOOT Pin(1)
	P2,P3	Function expansion pin
	P4	Debug Pin
	P5	Uart Switch Pin(2)
	P6	Serial voltage conversion 3.3V to 5V(3)
Power Test	J1	Module Power Test Pin(4)
LED Indicator	LED1（Power）	Power Indicator Light

(1). If the BOOT pin is connected to GND, the module starts normally. If the BOOT pin is connected to 3V3, the module enters BOOT mode for firmware upgrade.
(2). If you want to use the CON1/Micro USB interface to connect to a computer and use the serial port to test the device, please connect CRX-->TXD,CTX-->RXD. If you want to use the D0, D1 pins of the Arduino interface to use other master device control modules, connect TXD-->RX,RXD-->TX.
(3). When this interface is used with other master control devices, connect 5_3R-->TXD, 5_3T-->RXD if the IO voltage of the master device is controlled to 5V. If the voltage of the IO port of the master device is 3.3V, The interface does not need to be connected.
(4). This interface can be used to test the power consumption of the device. If you want to test the power consumption of the device, please remove the R6 resistance of the device first, then use an ammeter to connect the two ends of J1.

2. Quick Start Demonstrate

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

2.1 Join-Otaa

Welcome to RAK811

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

Send: at+get_config=dev_eui /* GET Dev_EUI check */
Return: OK3037343644357402

Send: at+set_config=app_eui:39d7119f920f7952&app_key:a6b08140dae1d795ebfa5a6dee1f4dbd
/* SET LoraGateway app_eui and app_key , big endian*/
Return: OK

Send: at+join=otaa/* Join OTAA type*/
Return: OK
at+recv=3,0,0/* Join status success*/

2.2 Join-Abp

Welcome to RAK811

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

Return: OK

Send: at+set_config=dev_addr:00112233&nwks_key:3432567afde4525e7890cfea234a5821
&apps_key:a48adfc393a0de458319236537a11d90
/* SET LoraGateway dev_addr nwks_key and apps_key , big endian*/

Return: OK

Send: at+join=abp /* Join ABP type*/
Return: OK

2.3 LoraWAN send&recv

/*After join gateway success, then can send and receive data*/

Send: at+send=0,2,000000000000007F0000000000000000
/*APP port:2, battery level 50%, unconfirmed message*/
Return: at+recv=2,0,0 /*unconfirmed mean tx success*/

Send: at+send=1,2,000000000000007F0000000000000000

/*APP port :2, battery level 50%, confirmed message*/

Return: at+recv=1,0,0/*confirmed mean receive ack from gateway*/

/*If gateway has data to send module, will receive date meanwhile ack */

Return: at+recv=0,2,10,30313233343536373839

/*APP port :2, receive size 10, hex:30313233343536373839*/

2.4 P2P send&recv

/* Module A Rx Side*/

Welcome to RAK811

Send: at+mode=1 /* SET LoraP2P work mode */

Return: OK

Send: at+rf_config=867700000,10,0,1,8,14

/* SET LoraP2P Frequency:867.7MHz, SF10,Bandwith 125KHz, coding Rate:4/5, Preamlen:8, tx power:14dbm */

Return: OK

Send: at+rxc=1 /* SET LoraP2P Rx continue enable report rx data */

Return: OK

Send: at+rx_stop /* If want stop Rx continue */

/* Module B Tx Side*/

Welcome to RAK811

Send: at+mode=1 /* SET LoraP2P work mode */

Return: OK

Send: at+rf_config=867700000,10,0,1,8,14

/* SET LoraP2P Frequency:867.7MHz, SF10,Bandwith 125KHz, coding Rate:4/5, Preamlen:8, tx power:14dbm */

Return: OK

Send: at+txc=100,1000,800100000600010002da9557e142d9

/* SET LoraP2P Tx continue ,100 packets, 1S interval, hex data */

Return: OK

Send: at+recv=9,0,0 /*When Tx complete */

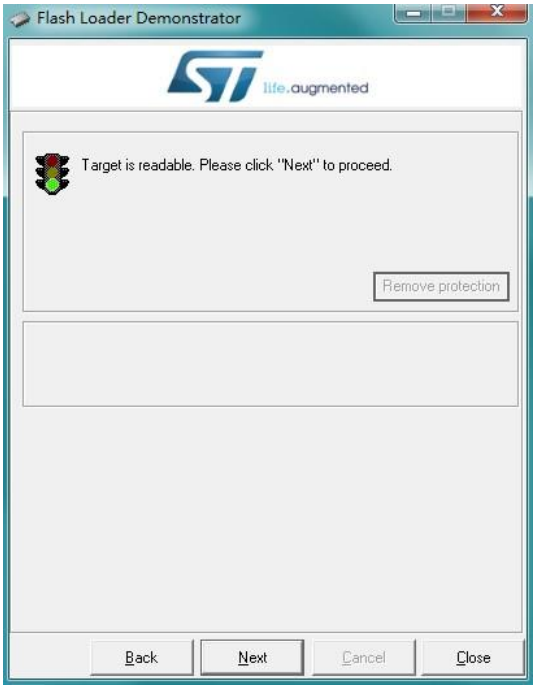
Send: at+tx_stop /* If want stop Tx continue */

3. Upgrade Firmware

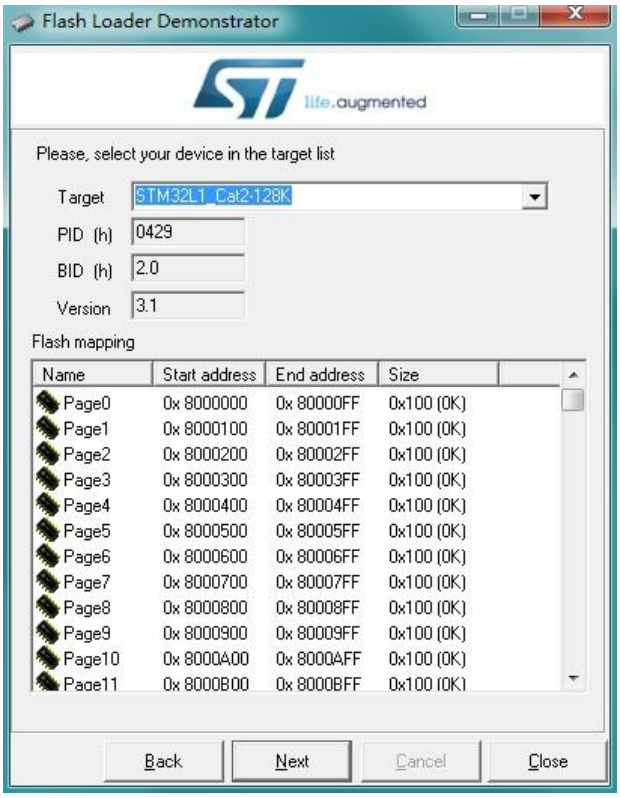
To upgrade the Lora module, First we should make the module get into Boot mode. We should switch the P1 pin make the Boot pin connection with 3.3V Pin. Then reset the module, Operate according to the steps:

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

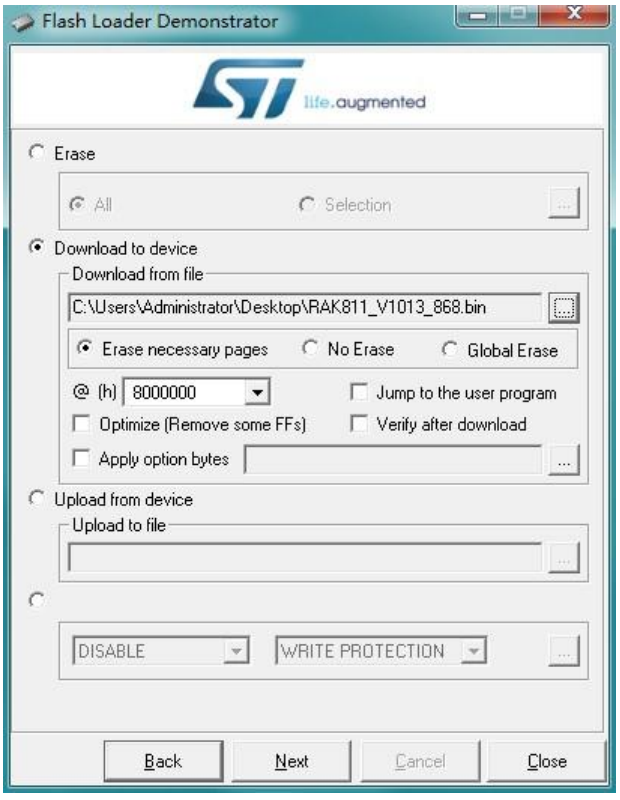
2.Click the “NEXT” button, arrive the following interface;



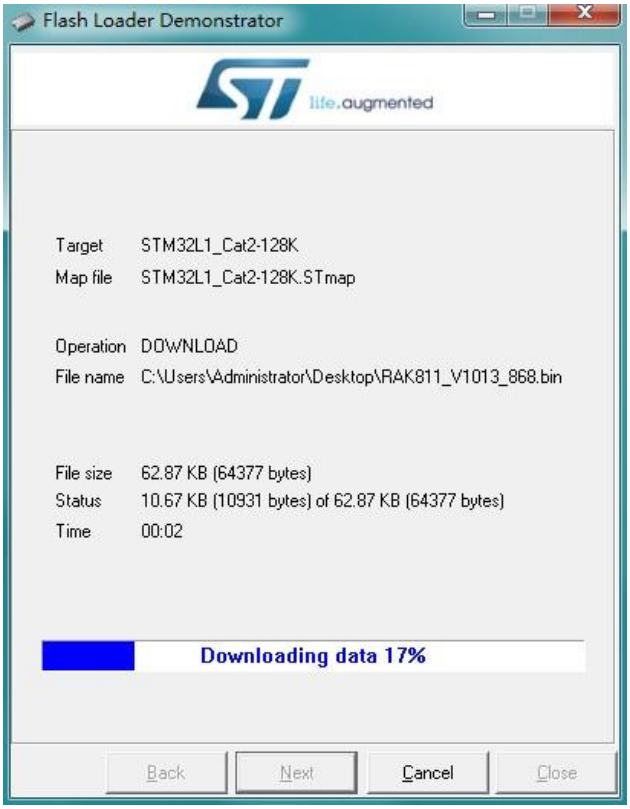
3.The again the “Next” button，Choose STM32L1_Cat2-128K;



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

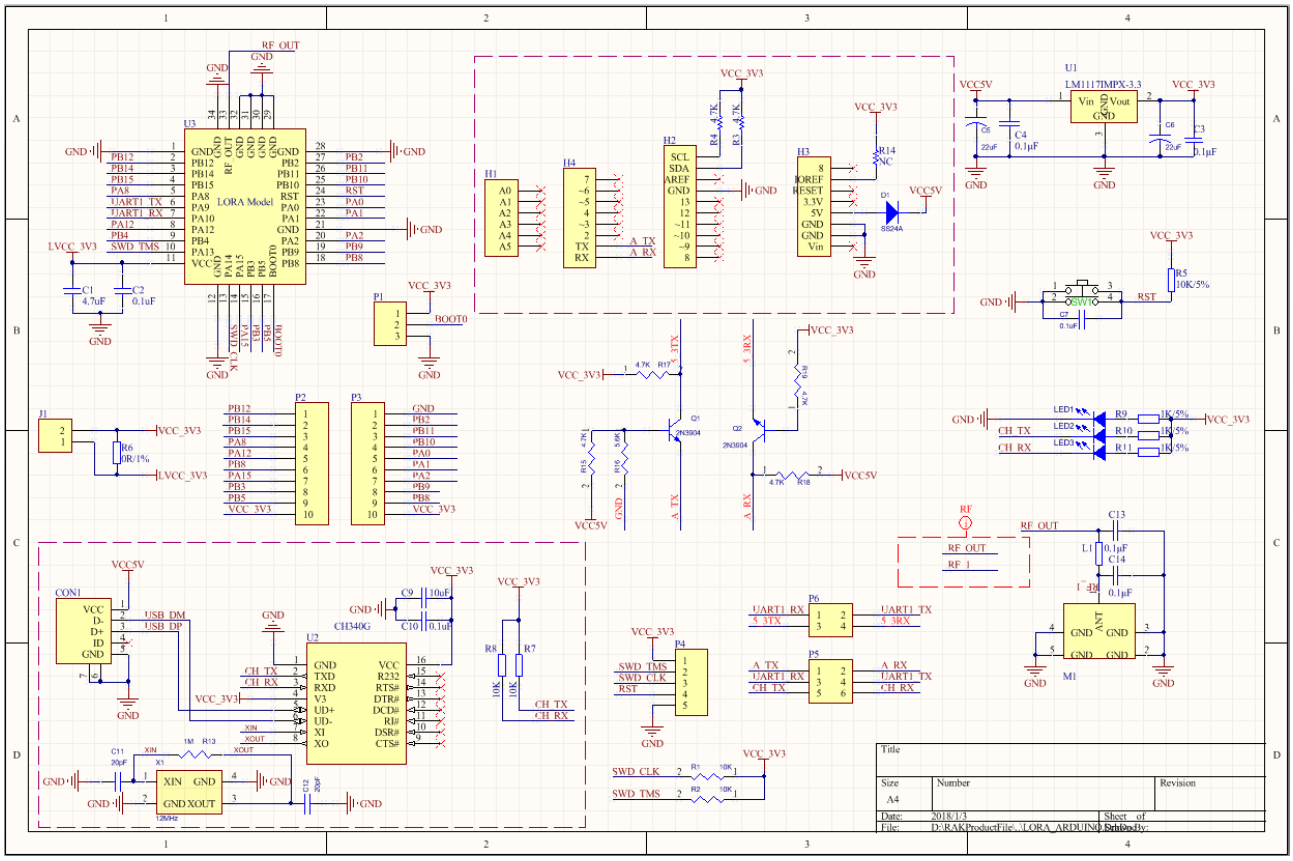


5.Upgrading：



6.Upgrade Successful.

4. Appendix


RF_OUT
GND
U3
LORA Model
VCC_3V3
VCC5V
U1
LM1117IMPX-3.3
H1
H2
H3
H4
P1
BOOT0
P2
P3
J1
R6
0R/1%
LVCC_3V3
Q1
2N3904
Q2
2N3604
A_TX
A_RX
CH_TX
CH_RX
LED1
LED2
LED3
R9
R10
R11
RST
SW10
CON1
USB_DM
USB_DP
U2
CH340G
C9
10uF
C10
0.1uF
R8
R7
10K
P4
P5
P6
SWD_TMS
SWD_CLK
RST
UART1_RX
UART1_TX
5_3TX
5_3RX
M1
Title
Size
A4
Number
Revision
Date:
2018/1/3
Sheet of
File:
D:\RAKProductFile\...\LORA_ARDUINO_Schdoc
Drawn By:

5. Modify Record

Version	Author	Data	Modify content
V1.0	Cao.xiaocheng	2016/12/09	Create Document
V1.1	wenyong.tang	2017/03/01	Modify Document
V1.2	Chace	2017/12/10	Modify the schematic
V1.3	Chace	2018/06/29	Update picture