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Technology Co., Ltd.

WisNodeV1.1-LoRa-Arduino Library Use Guide V1.1

Shenzhen Rakwireless Technology Co., Ltd.

www.rakwireless.com

info@rakwireless.com

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1. RAK811 Arduino Library Use Guide

(1) Download

We upload the RAK811 Arduino library code to the official github. You can find this library at github:<https://github.com/RAKWireless/WisNode-Arduino-Library>

RAKWireless / WisNode-Arduino-Library

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This repo is used for Arduino board + WisNode-LoRa RAK811 board. Edit

Manage topics

9 commits 1 branch 0 packages 0 releases 1 contributor

Branch: master New pull request Create new file Upload files Find file Clone or download

RAKWireless update WisNode V1.1 V1.2 library Latest commit 96d64d4 14 hours ago

File	Commit	Time
Documents and tools	update WisNode V1.1 V1.2 library	14 hours ago
WisNodeV1.1 Arduino Library	update WisNode V1.1 V1.2 library	14 hours ago
WisNodeV1.2 Arduino Library/Arduino-RAK811-Library	update WisNode V1.1 V1.2 library	14 hours ago
README.md	Update README.md	last month
WisNode_Arduino_Library API Manual V1.0.pdf	update WisNode V1.1 V1.2 library	14 hours ago

Download the library folder "[Arduino-RAK811-Library](#)".

(2) Add to Arduino IDE

① Copy the "[Arduino-RAK811-Library](#)" folder to the Arduino library folder.

C:\Users\wanglb\Documents\Arduino\libraries

名称	修改日期	类型	大小
Adafruit_ADXL343	2020/1/6 14:33	文件夹	
Adafruit_BME680_Library	2020/1/6 14:25	文件夹	
Adafruit_Unified_Sensor	2020/1/6 14:33	文件夹	
Arduino_LPS22HB	2020/1/7 18:36	文件夹	
ArduinoCore-samd-master	2019/12/5 17:15	文件夹	
arduino-LoRa-master	2019/12/16 9:51	文件夹	
Arduino-RAK811-Library	2019/12/19 9:01	文件夹	
BlueDot_BME680_Library	2020/1/7 18:38	文件夹	
BSEC_Software_Library	2020/1/8 15:00	文件夹	
ClosedCube_BME680	2020/1/8 15:34	文件夹	
MCCI_LoRaWAN_LMIC_library	2019/12/19 15:54	文件夹	
SparkFun_SHTC3_Humidity_and_Tem...	2020/1/7 18:29	文件夹	
MCCI_LoRaWAN_LMIC_library.zip	2020/1/8 17:29	360压缩 ZIP 文件	3,201 KB
readme.txt	2019/12/5 17:14	文本文档	1 KB

② And then open the Arduino IDE, you can see the RAK811 sample code in the

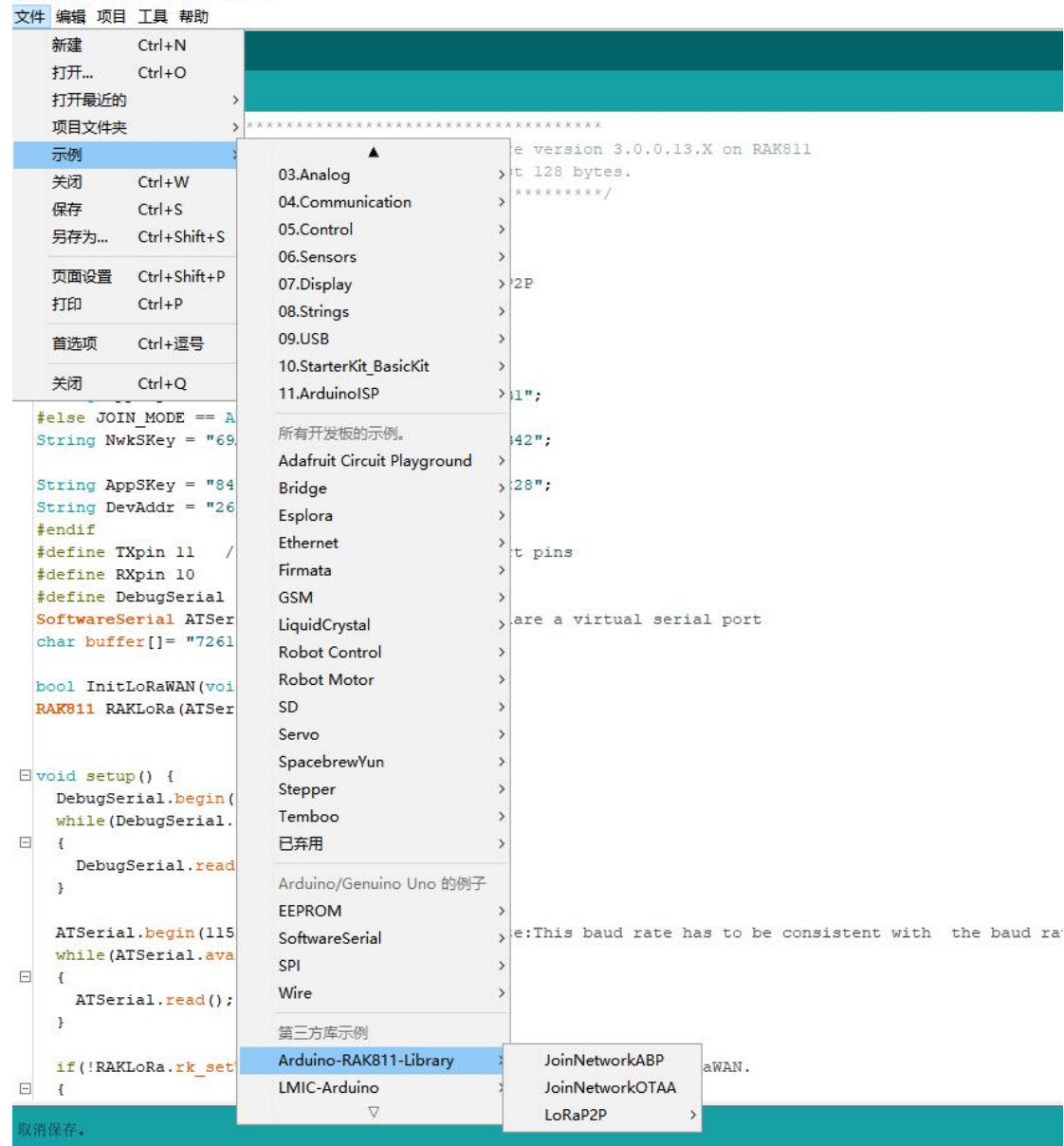


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Arduino example.

JoinNetworkABP | Arduino 1.8.10



(3)Code introduction

On the library contains the available functions, the user can refer to [WisNode_Arduino_Library_API_Manual_V1.1.pdf](#), which has a detailed note on the use of each function.

Note: Before compile by Arduino IDE, user should better configure Serial RX and TX buffer size. This must be configured manually in Arduino installation directory.



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The following are the minimum recommended sizes.

名称	修改日期	类型	大小
abi.cpp	2017/12/11 16:14	C++ Source File	2 KB
Arduino.h	2019/5/16 20:52	H 文件	8 KB
binary.h	2019/5/16 20:52	H 文件	11 KB
CDC.cpp	2019/5/16 20:52	C++ Source File	9 KB
Client.h	2019/5/16 20:52	H 文件	2 KB
HardwareSerial.cpp	2019/5/16 20:52	C++ Source File	9 KB
HardwareSerial.h	2020/1/16 14:48	H 文件	6 KB
HardwareSerial_private.h	2019/5/16 20:52	H 文件	5 KB
HardwareSerial0.cpp	2019/5/16 20:52	C++ Source File	3 KB
HardwareSerial1.cpp	2019/5/16 20:52	C++ Source File	3 KB
HardwareSerial2.cpp	2019/5/16 20:52	C++ Source File	2 KB
HardwareSerial3.cpp	2019/5/16 20:52	C++ Source File	2 KB
hooks.c	2017/11/27 19:21	C 文件	2 KB
IPAddress.cpp	2019/5/16 20:52	C++ Source File	3 KB
IPAddress.h	2019/5/16 20:52	H 文件	3 KB
main.cpp	2019/5/16 20:52	C++ Source File	2 KB
new.cpp	2017/12/11 16:14	C++ Source File	2 KB
new.h	2017/12/11 16:14	H 文件	1 KB
PluggableUSB.cpp	2019/5/16 20:52	C++ Source File	3 KB
PluggableUSB.h	2019/5/16 20:52	H 文件	3 KB
Print.cpp	2019/5/16 20:52	C++ Source File	6 KB
Print.h	2019/5/16 20:52	H 文件	3 KB
Printable.h	2019/5/16 20:52	H 文件	2 KB
Server.h	2019/5/16 20:52	H 文件	1 KB
Stream.cpp	2019/5/16 20:52	C++ Source File	9 KB
Stream.h	2019/5/16 20:52	H 文件	6 KB
Tone.cpp	2019/5/16 20:52	C++ Source File	15 KB
Udp.h	2019/5/16 20:52	H 文件	5 KB
USBAPI.h	2019/5/16 20:52	H 文件	7 KB
USBCore.cpp	2019/5/16 20:52	C++ Source File	20 KB
USBCore.h	2019/5/16 20:52	H 文件	9 KB
USBDesc.h	2019/5/16 20:52	H 文件	2 KB
WCharacter.h	2019/5/16 20:52	H 文件	5 KB
WInterrupts.c	2019/5/16 20:52	C 文件	10 KB
wiring.c	2018/10/29 15:58	C 文件	12 KB
wiring_analog.c	2017/12/18 15:53	C 文件	8 KB
wiring_digital.c	2019/5/16 20:52	C 文件	5 KB

C:\Program Files (x86)\Arduino\hardware\arduino\avr\cores\arduino\HardwareSerial.h - Notepad++ [Administrator]

```
28 #include "Stream.h"
29
30 // Define constants and variables for buffering incoming serial data. We're
31 // using a ring buffer (I think), in which head is the index of the location
32 // to which to write the next incoming character and tail is the index of the
33 // location from which to read.
34 // NOTE: a "power of 2" buffer size is recommended to dramatically
35 // optimize all the modulo operations for ring buffers.
36 // WARNING: When buffer sizes are increased to > 256, the buffer index
37 // variables are automatically increased in size, but the extra
38 // atomicity guards needed for that are not implemented. This will
39 // often work, but occasionally a race condition can occur that makes
40 // Serial behave erratically. See https://github.com/arduino/Arduino/issues/2405
41 #if defined(SERIAL_TX_BUFFER_SIZE)
42 #if ((RAMEND - RAMSTART) < 1023)
43 #define SERIAL_TX_BUFFER_SIZE 16
44 #else
45 #define SERIAL_TX_BUFFER_SIZE 70
46 #endif
47 #endif
48 #if defined(SERIAL_RX_BUFFER_SIZE)
49 #if ((RAMEND - RAMSTART) < 1023)
50 #define SERIAL_RX_BUFFER_SIZE 16
51 #else
52 #define SERIAL_RX_BUFFER_SIZE 110
53 #endif
54 #endif
55 #if (SERIAL_TX_BUFFER_SIZE > 256)
56 typedef uint16_t tx_buffer_index_t;
57 #else
58 typedef uint8_t tx_buffer_index_t;
59 #endif
60 #if (SERIAL_RX_BUFFER_SIZE > 256)
61 typedef uint16_t rx_buffer_index_t;
62 #else
63 typedef uint8_t rx_buffer_index_t;
64 #endif
65
```

If the RAM size of Arduino board is enough big, these two buffer size need config better bigger.

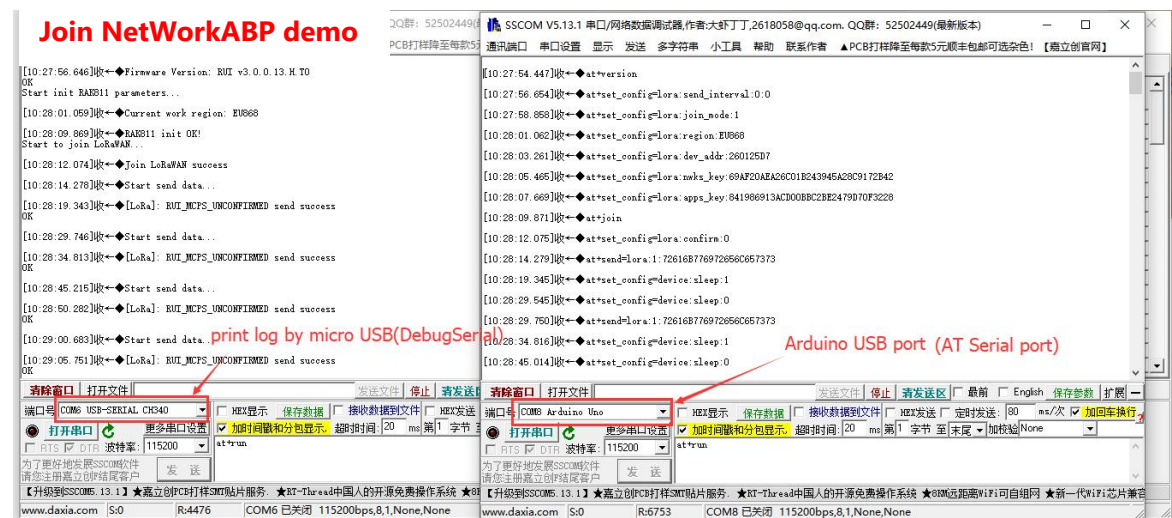
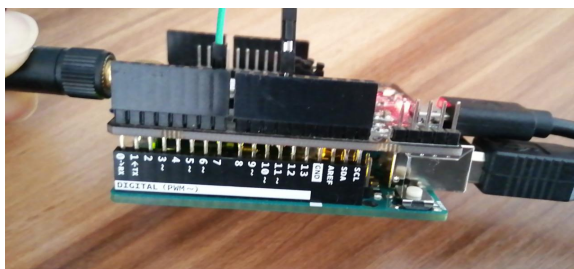
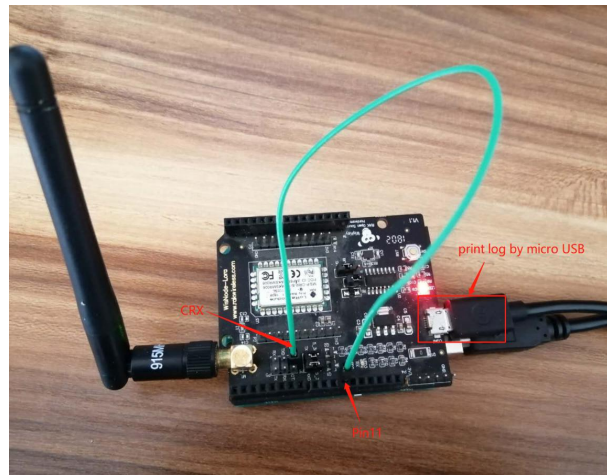
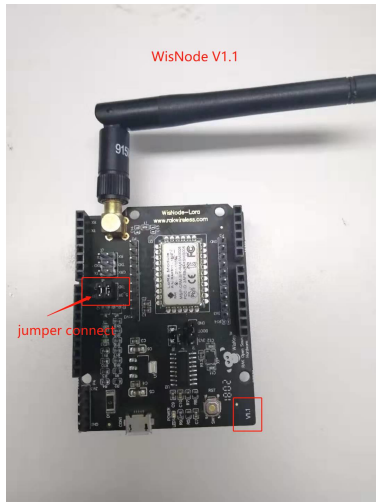


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2. Hardware connect

This document will use **Arduino Uno + WisNode-LoRa** as an example.





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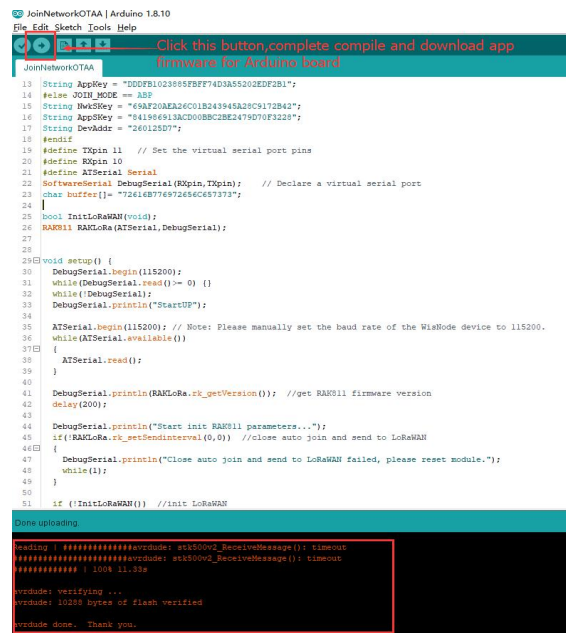
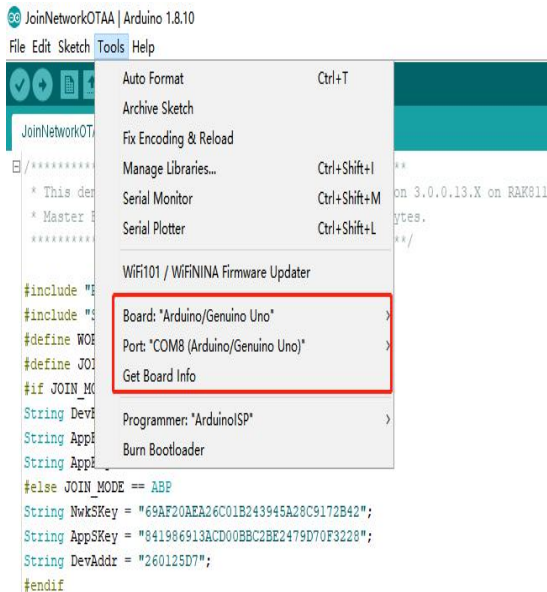
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3. Flash firmware

①Flash firmware for RAK811 ,refer to :[Get Start with RAK811 WisNode-LoRa.pdf](#)

RAK811-Firmware:<https://github.com/RAKWireless/WisNode-Arduino-Library/tree/master/Documents%20and%20tools/RAK811-Firmware>

②Complie and Flash app demo [JoinNetworkOTAA.ino](#) through Arduino IDE(disconnect WisNode board before flash).





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4. Test LoRa Node with LoRaWAN

Serial console log:

```
[18:03:55.444]收←StartUP
[18:03:57.647]收←att+version
Firmware Version: RUI v3.0.0.13.H
OK
[18:03:57.851]收←Start init RAK811 parameters...
[18:04:02.263]收←Current work region: EU868
[18:04:11.079]收←RAK811 init OK!
Start joining LoRaWAN
[18:04:22.516]收←[LoRa].Join Success
OK
[18:04:24.722]收←Start send data...
[18:04:30.793]收←[LoRa]: RUI_MCPS_UNCONFIRMED send success
OK
[18:04:45.202]收←Start send data...
[18:04:50.929]收←[LoRa]: RUI_MCPS_UNCONFIRMED send success
OK
att+recv=0,-33,8,0
[18:05:11.413]收←[LoRa]: RUI_MCPS_UNCONFIRMED send success
OK
[18:05:25.825]收←Start send data...
[18:05:31.896]收←[LoRa]: RUI_MCPS_UNCONFIRMED send success
OK
[18:05:46.306]收←Start send data...
[18:05:52.378]收←[LoRa]: RUI_MCPS_UNCONFIRMED send success
OK
[18:06:06.787]收←Start send data...
[18:06:12.859]收←[LoRa]: RUI_MCPS_UNCONFIRMED send success
OK
```

SoftSerial port

```
att+version
[18:03:57.855]收←att+set_config=lorawan:send_interval:0:0
[18:04:00.058]收←att+set_config=lorawan:join_mode:0
[18:04:02.263]收←att+set_config=lorawan:region:EU868
[18:04:04.465]收←att+set_config=lorawan:dev_eui:8680000000000001
[18:04:06.673]收←att+set_config=lorawan:app_eui:70B3D57ED00285A7
[18:04:08.876]收←att+set_config=lorawan:app_key:D00FB1023885F8FF74D3A55202EDF2B1
[18:04:11.083]收←att+join
[18:04:22.519]收←att+set_config=lorawan:confirm:0
[18:04:24.724]收←att+send=lorawan:1:72616B776972656C657373
[18:04:30.797]收←att+set_config=device:sleep:1
[18:04:43.003]收←att+set_config=device:sleep:0
[18:04:45.205]收←att+send=lorawan:1:72616B776972656C657373
[18:04:50.935]收←att+set_config=device:sleep:1
[18:05:03.141]收←att+set_config=device:sleep:0
[18:05:05.346]收←att+send=lorawan:1:72616B776972656C657373
[18:05:11.419]收←att+set_config=device:sleep:1
[18:05:23.624]收←att+set_config=device:sleep:0
[18:05:25.824]收←att+send=lorawan:1:72616B776972656C657373
[18:05:31.901]收←att+set_config=device:sleep:1
[18:05:44.102]收←att+set_config=device:sleep:0
[18:05:46.308]收←att+send=lorawan:1:72616B776972656C657373
[18:05:52.381]收←att+set_config=device:sleep:1
```

Arduino USB port

TTN log:

APPLICATION DATA					pause	clear
Filters						
uplink downlink activation ack error						
time	counter	port				
18:05:48	0	1	payload: 72 61 6B 77 69 72 65 6C 65 73 73			
18:05:48	4	1	payload: 72 61 6B 77 69 72 65 6C 65 73 73			
18:05:28	0	1				
18:05:27	3	1	payload: 72 61 6B 77 69 72 65 6C 65 73 73			
18:05:12	0	1				
18:05:07	2	1	payload: 72 61 6B 77 69 72 65 6C 65 73 73			
18:04:48	0	1				
18:04:47	1	1	payload: 72 61 6B 77 69 72 65 6C 65 73 73			
18:04:27	0	1				
18:04:26	0	1	payload: 72 61 6B 77 69 72 65 6C 65 73 73			
18:04:13			dev addr: 26 01 21 3D app eui: 70 B3D5 7E D002 85 A7 dev eui: 86 80 00 00 00 00 00 01			



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If you have any questions, welcome to our forum to ask your question:

<http://support.rakwireless.com/>.

You can also send your question to this email: ken.yu@rakwireless.com