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Technology Co., Ltd.

# **WisNodeV1.2-LoRa-Arduino Library Use Guide V1.1**

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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

File	Commit	Time
Documents and tools	update WisNode V1.1 V1.2 library	16 hours ago
WisNodeV1.1 Arduino Library	update WisNode V1.1 V1.2 library	16 hours ago
<b>WisNodeV1.2 Arduino Library/Arduino-RAK811-Library</b>	update WisNode V1.1 V1.2 library	16 hours ago
README.md	Update README.md	last month
WisNode_Arduino_Library API Manual V1.0.pdf	update WisNode V1.1 V1.2 library	16 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

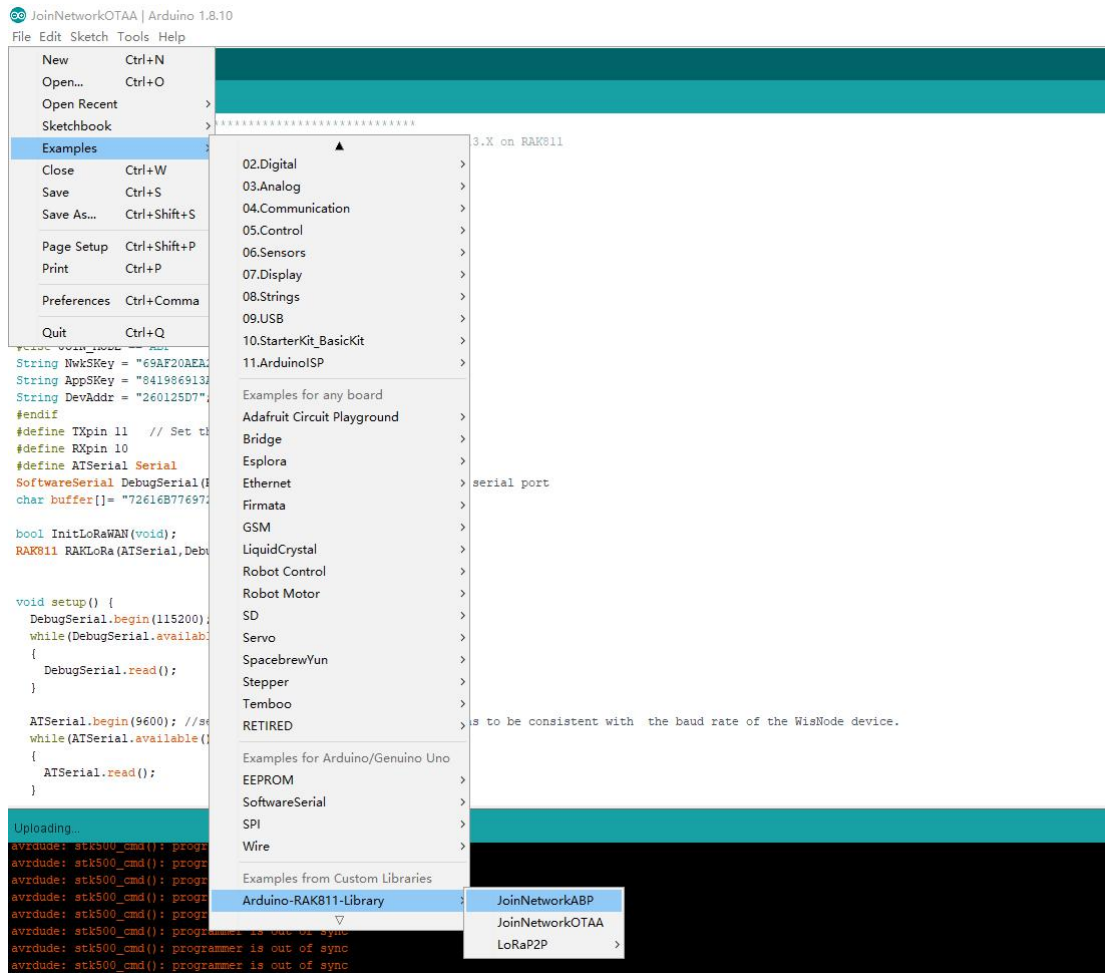
名称	修改日期	类型	大小
Adafruit_ADXL343	2020/1/6 14:33	文件夹	
Adafruit_BME680_Library	2020/1/6 14:25	文件夹	
Adafruit_Unified_Sensor	2020/1/6 14:33	文件夹	
Arduino_LPS22HB	2020/1/7 18:36	文件夹	
ArduinoCore-samd-master	2019/12/5 17:15	文件夹	
arduino-LoRa-master	2019/12/16 9:51	文件夹	
<b>Arduino-RAK811-Library</b>	2019/12/19 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



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



### (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. The following are the minimum recommended sizes.



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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
wiring_pulse.c	2017/12/18 15:53	C 文件	2 KB

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

文件(F) 编辑(E) 搜索(S) 视图(V) 编码(N) 语言(L) 设置(T) 工具(O) 宏(M) 运行(R) 插件(P) 窗口(W) ?

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

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



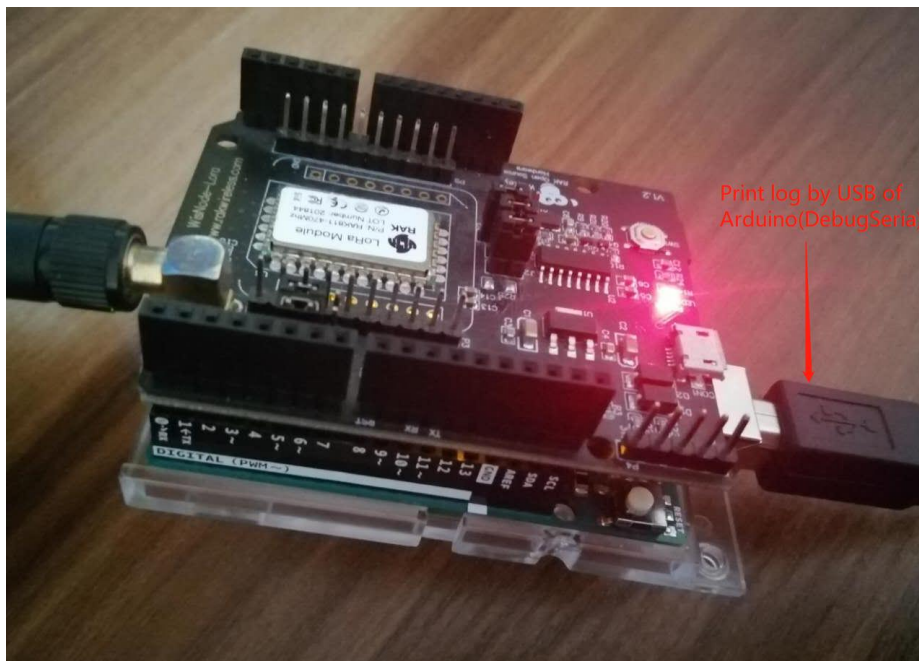
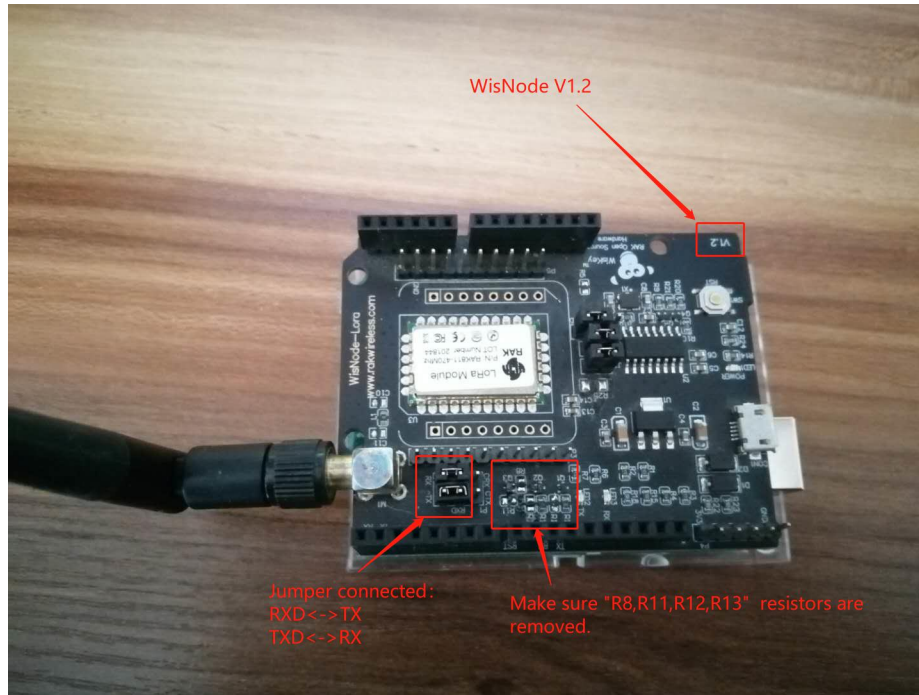


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## 2. Hardware connect

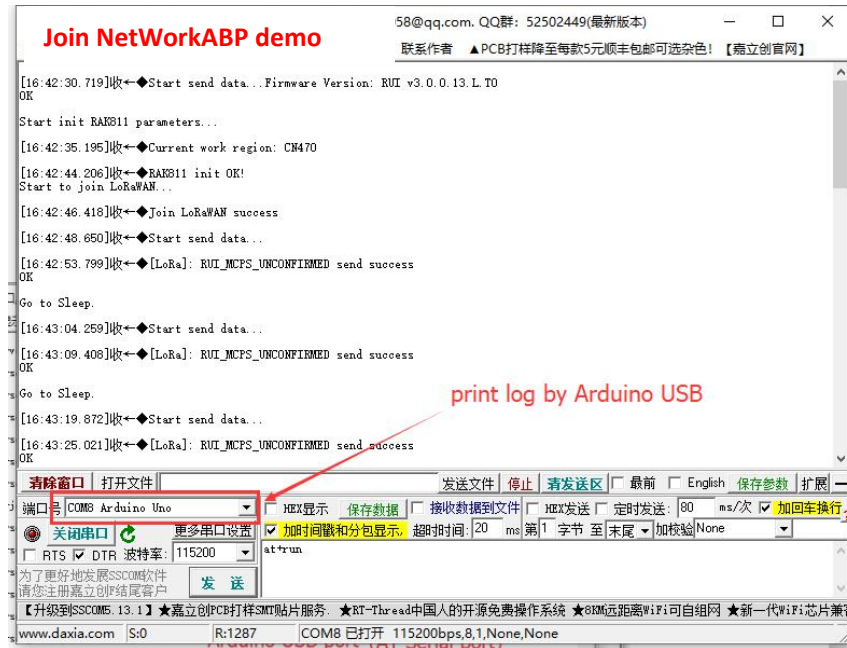
This document will use **Arduino Uno + WisNode-LoRa** as an example.





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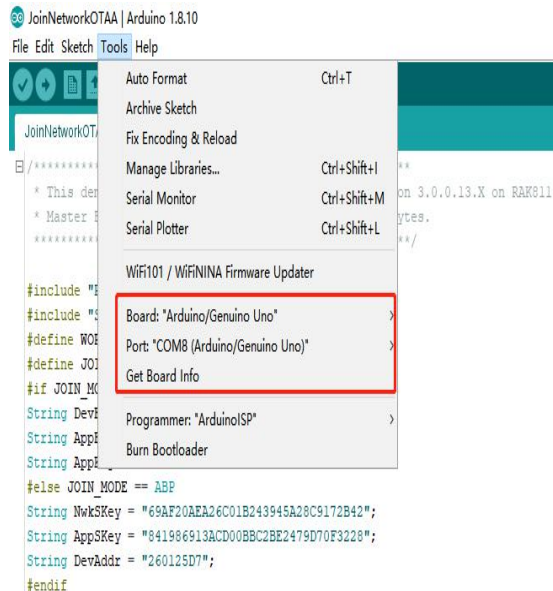
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### 3. Flash firmware

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>

②Compile and Flash app demo [JoinNetworkOTAA.ino](#) through Arduino IDE.







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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						



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](mailto:ken.yu@rakwireless.com)