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Technology Co., Ltd.

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

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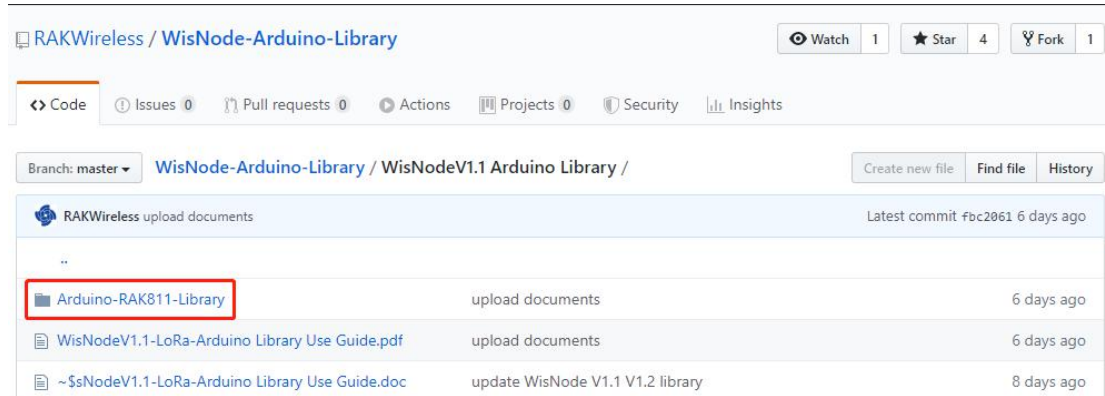
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1. RAK811 Arduino Library Use Guide

(1) Download

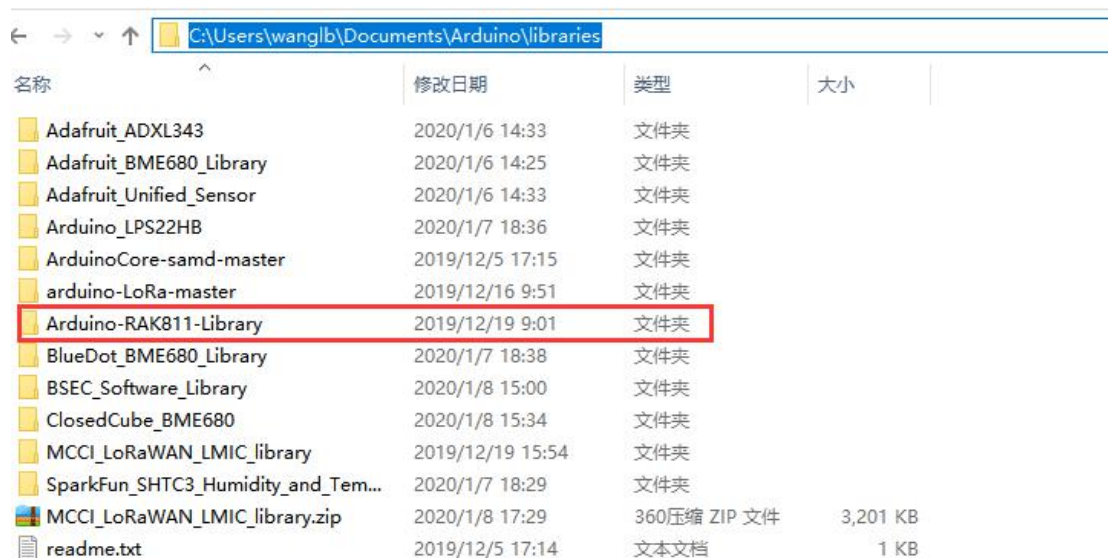
We upload the RAK811 Arduino library code to the official github. You can find this library at github:<https://github.com/RAKWireless/WisNode-Arduino-Library>



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

(2) Add to Arduino IDE

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



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

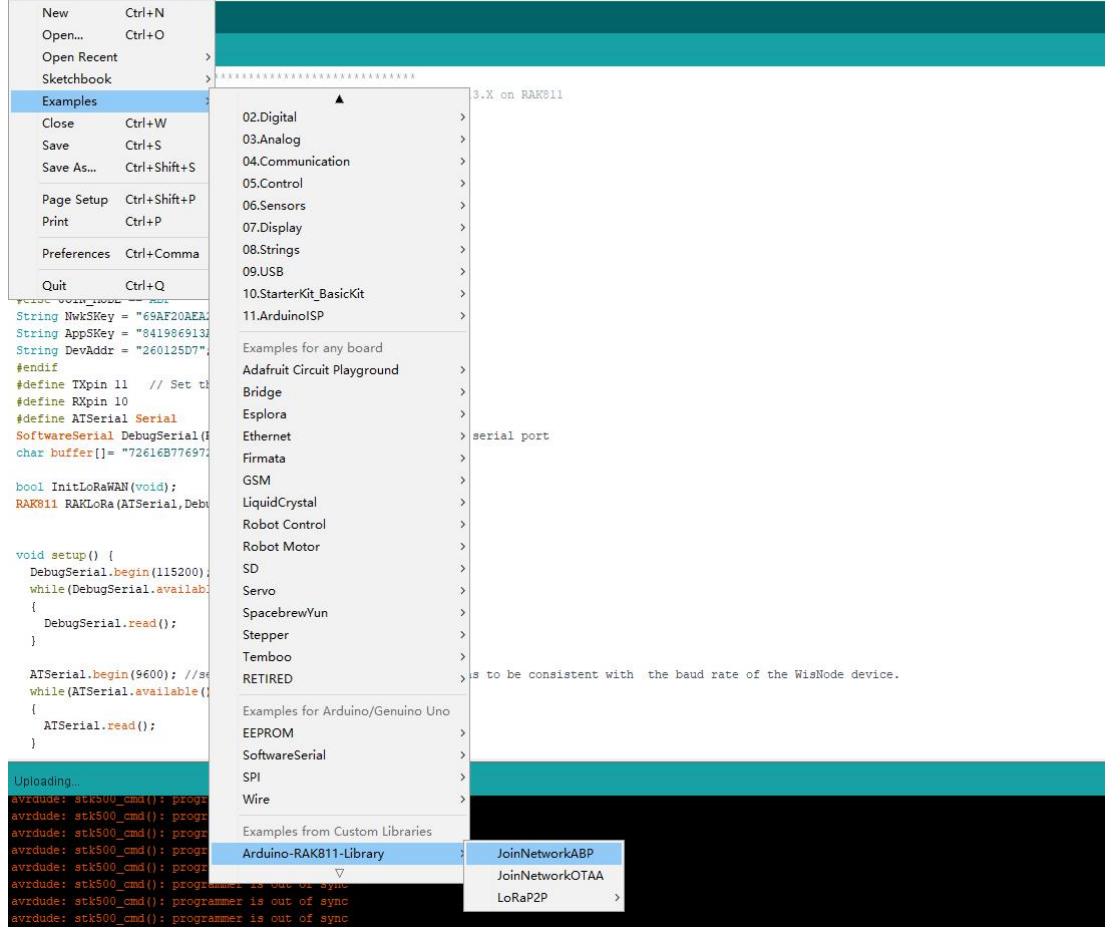


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JoinNetworkOTAA | Arduino 1.8.10

File Edit Sketch Tools Help



(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

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.

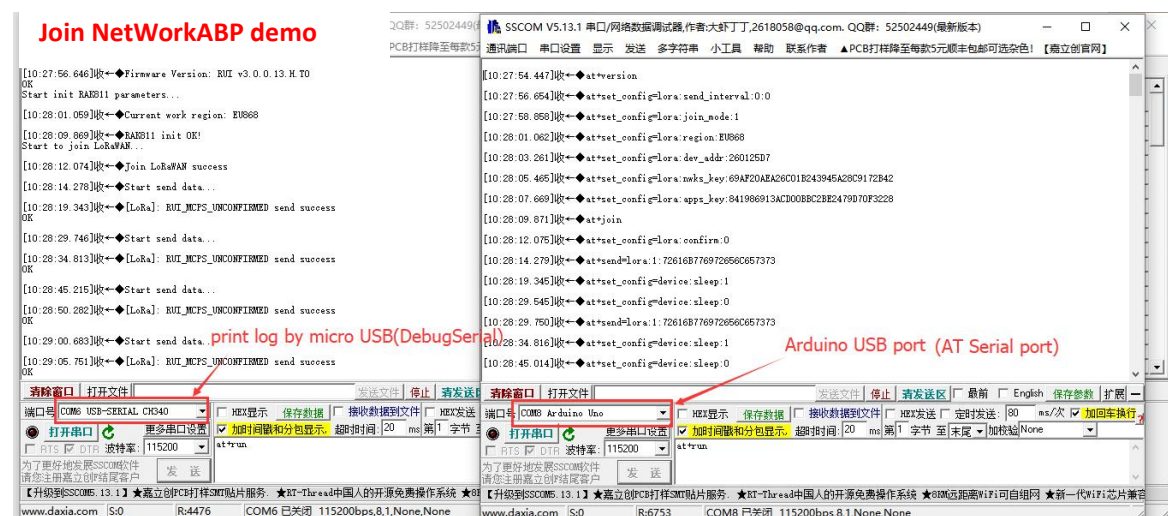
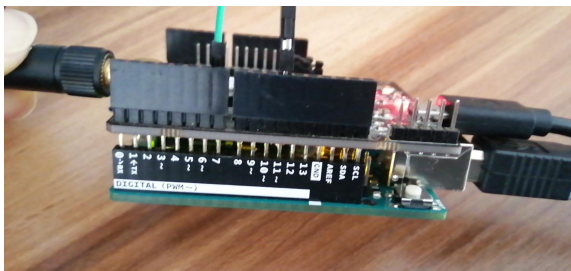
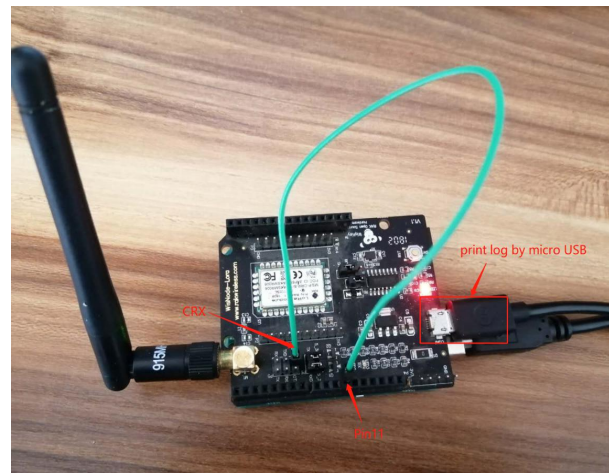
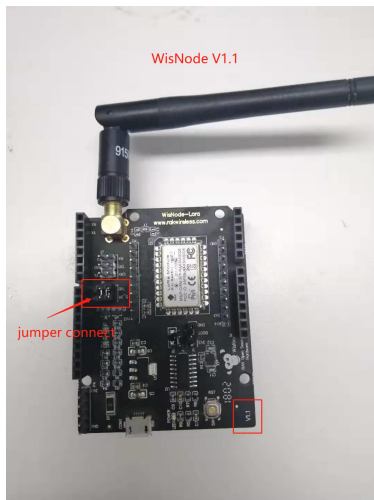


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2. Hardware connect

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





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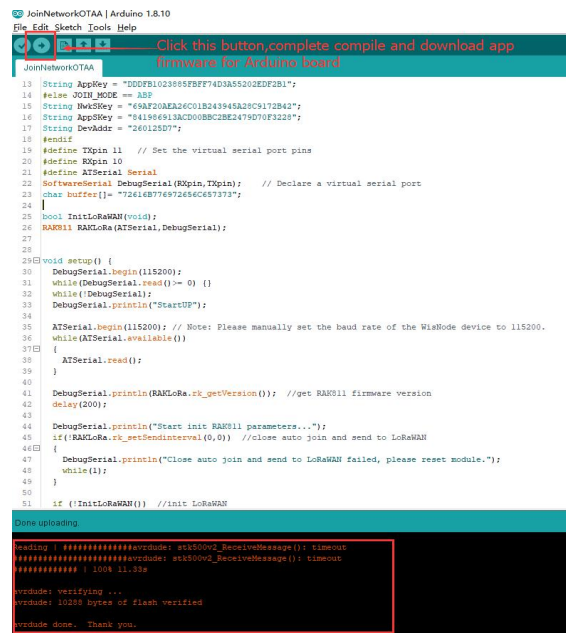
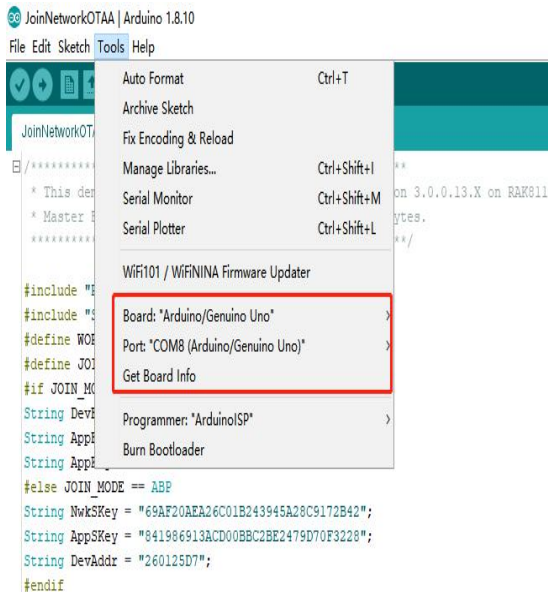
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3. Flash firmware

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>

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