

User Manual for

RAK DFU Tool Function Description

Version 1.3 | August 2020

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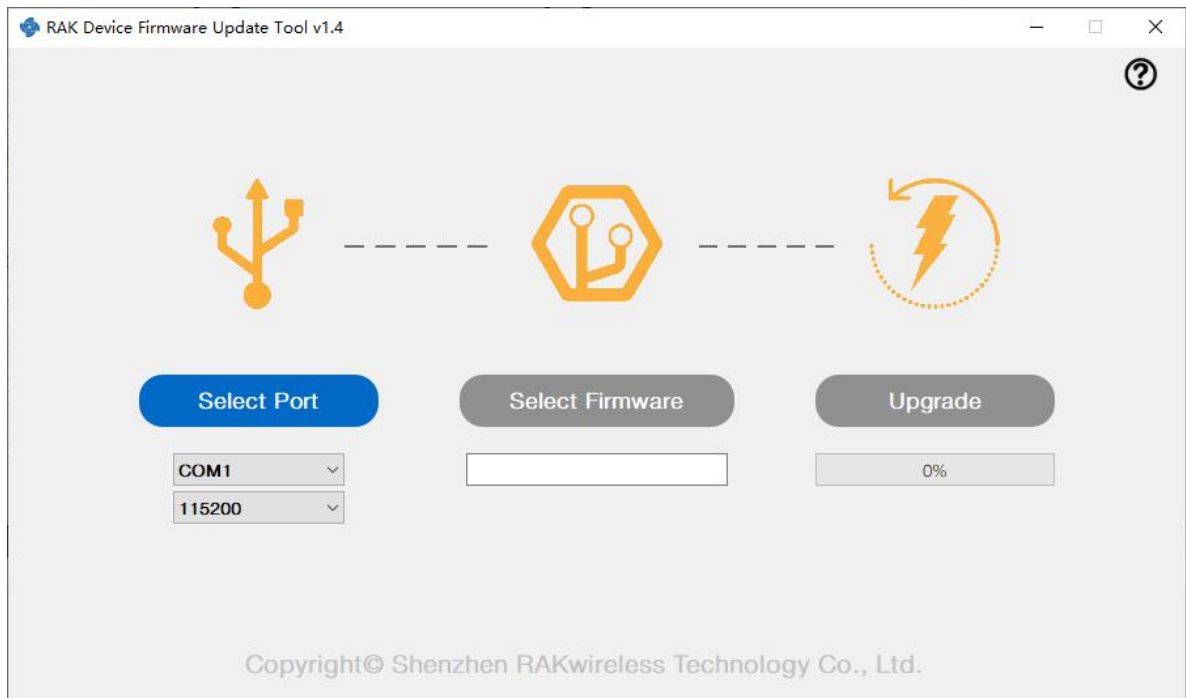
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1. Brief

Rak products support firmware upgrade to update application firmware. When a module releases new firmware, which optimizes the processing logic or adds new functions, users can use the firmware upgrade tool to update the firmware of the module. The core function of the software is to send the firmware file to the module through UART using the ymodem protocol.

The software supports the upgrade of standard modules and products. The standard module includes rak811, rak4200, rak4270. The products include rak7201, rak7204, etc.

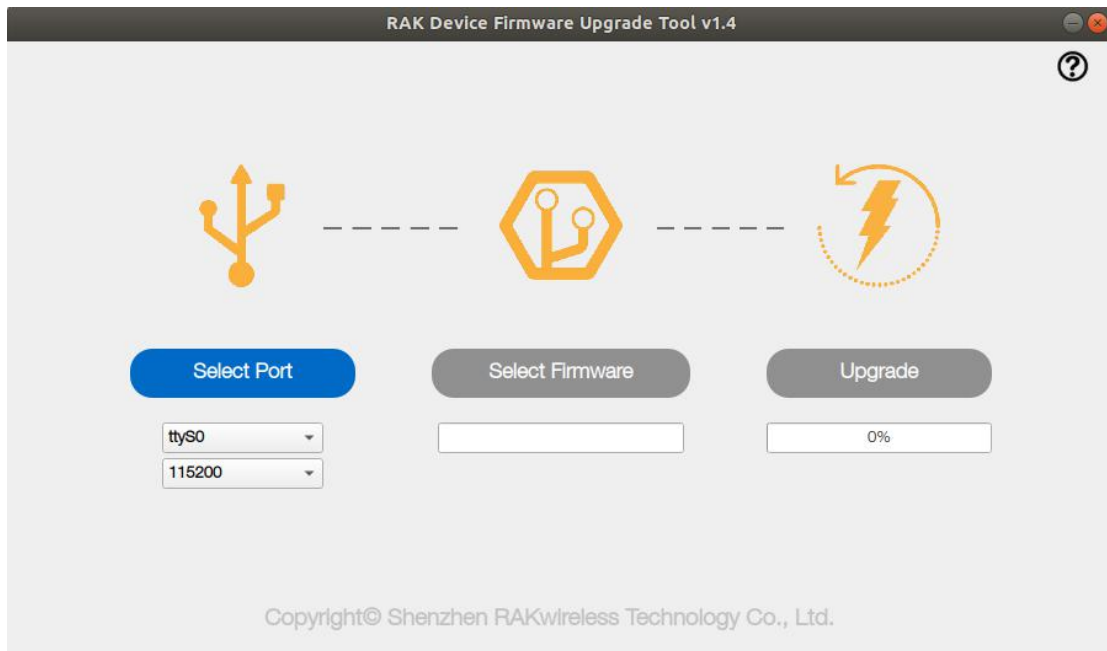
The main interface of the tool is as follows.



The tool can be started by double-clicking on the Windows platform. On Linux and Mac platforms, it needs to be started via the command line in the terminal.

In the Ubuntu system, the startup commands and the interface after startup are as follows.

```
cd RAK_DFU_Tool/bin/  
chmod +x RAK_Device_Firmware_Upgrade_Tool_v1.4  
sudo ./RAK_Device_Firmware_Upgrade_Tool_v1.4  
user@ubuntu:~$ cd Desktop/RAK_DFU_Tool/bin/  
user@ubuntu:~/Desktop/RAK_DFU_Tool/bin$ chmod +x RAK_Device_Firmware_Upgrade_Tool_v1.4  
user@ubuntu:~/Desktop/RAK_DFU_Tool/bin$ sudo ./RAK_Device_Firmware_Upgrade_Tool_v1.4
```

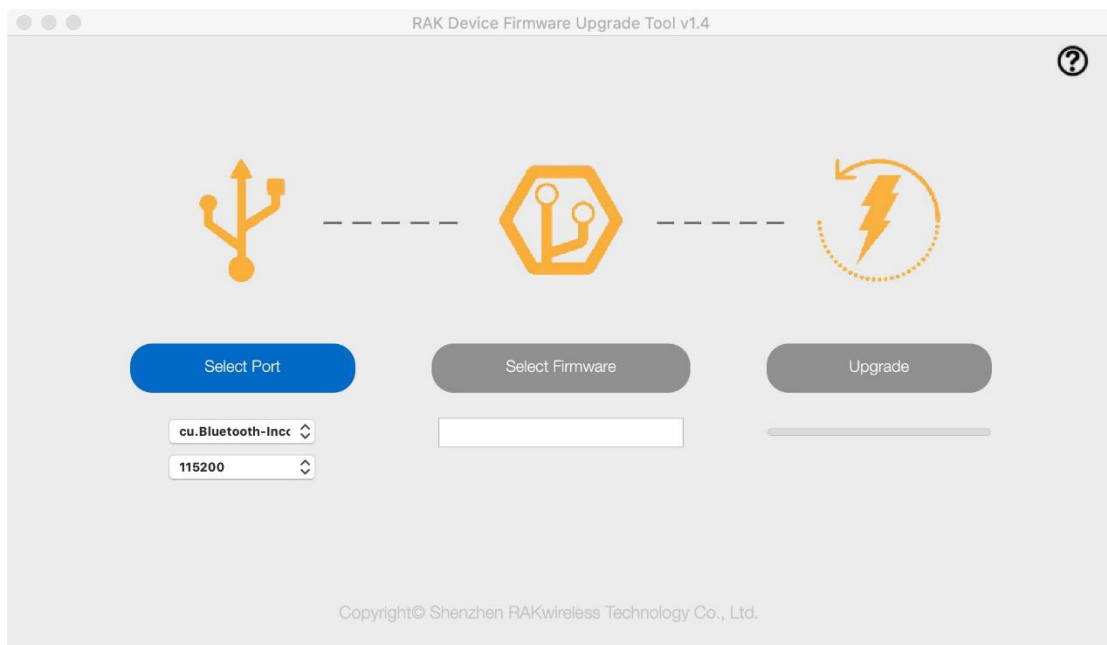


In the MacOS system, the startup commands and the interface after startup are as follows.

cd RAK\ DFU\ Tool\ v1.4.app/Contents/MacOS/
./RAK\ DFU\ Tool\ v1.4

```

MacOS — -bash — 100x21
[rakwirelessdeMacBook-Pro:Desktop rakwireless$ cd RAK\ DFU\ Tool\ v1.4.app/Contents/MacOS/ ]
[rakwirelessdeMacBook-Pro:MacOS rakwireless$ ./RAK\ DFU\ Tool\ v1.4 ]
  
```



2. Function Description

The process for users to use DFU tools is as follows.

1. First, connect the computer and the module together, so that they can communicate with each other through the serial port.
2. After starting the software, select the serial port number and communication baud rate connected with the module. Click the "Select Port" button.
3. Click the "Select Firmware" button to select the firmware to be upgraded. Generally, the suffix of the firmware is ".bin".
4. Click the "Upgrade" button to start the upgrade process.

For DFU tools, the main processing logic is under the "Upgrade" button. The functions of DFU are listed below.

1. After clicking the upgrade button, the DFU tool first sends the command "at+version\r\n" to the module.
2. DFU tool sends "at+boot\r\n" command, the module will switch to bootloader mode, and send "<BOOT MODE>\r\n" to the tool.
3. DFU tool sends "at+update\r\n", and the module switches to upgrade state.
4. The DFU tool sends the upgrade firmware selected by the user according to the ymodem protocol.

Note:

1. The firmware version supported by the tool should be 3. x.x.14 or above.
2. The baud rate range supported by the module application firmware is 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200.
3. If the upgrade process is interrupted, reset the module and reopen the upgrade tool for upgrade operation.



3. Data flow example

The following grabs the serial data interaction data in the process of upgrade start and end.

Phase in the picture indicates the direction of data transmission, out indicates the data from DFU tool to module, in indicates the data from module to DFU tool. The data selected in the red box in the second picture is the initialization information printed by the application firmware after the module is upgraded successfully.

Device	Phase	Data	Description	Cnd.Phase.Ofs(rep)
21	OUT	61 74 2b 76 65 72 73 69 6f 6e 0d 0a	at+version	1.1.0
21	IN	4f 4b 20 56 33 2e 32 2e 30 2e 31 34 2e 62 65 74 61 34 0d 0a	OK V3.2.0.14.beta4...	2.1.0
21	OUT	61 74 2b 62 6f 6f 74 04 0a	at+boot	3.1.0
21	IN	3c 42 4f 4f 54 20 4d 4f 44 45 3e 0d 0a	<BOOT MODE>...	4.1.0
21	OUT	61 74 2b 75 70 64 61 74 65 0d 0a	at+update	5.1.0
21	IN	53 74 61 72 74 20 66 69 72 6d 77 61 72 65 20 75 70 67 72 61 64 65 2e 2e 2e 0d 0a	Start firmware upgrade.....	6.1.0
21	IN	43	C	7.1.0
21	OUT	01 00 ff 52 41 4b 34 32 30 30 5f 76 33 2e 32 2e 30 2e 34 5f 32 30 32 30 30 35 30 38 2e 62 69 6e	... RAK4200_v3.2.0.4_20200508.bin	8.1.0
21	IN	06 43	C	9.1.0
21	OUT	02 01 fe 00 50 00 20 2d 79 01 08 31 81 00 08 7d 79 01 08 00 00 00 00 00 00 00 00 00 00 00 00	...P...y...y.....	10.1.0
21	IN	06	...	11.1.0
21	OUT	02 02 fd 52 41 83 08 8b 42 01 d3 8b 00 c0 1a 52 41 d9 d2 43 08 8b 42 01 d3 4b 00 c0 1a 52 41 41	...RA...B...RA...C...B...K...RAA	12.1.0
21	IN	06	...	13.1.0
21	OUT	02 03 fc 00 2e e7 d1 8b 42 de d1 94 42 05 dd 02 21 58 1e 08 40 01 38 db e7 00 24 a2 42 04 dc b5	...B...B...X...0.8...\$B...	14.1.0
21	IN	06	...	15.1.0
21	OUT	02 61 9e 1d 00 00 00 b8 9e 01 08 1e 00 00 00 c4 9e 01 08 1f 00 00 00 d0 9e 01 08 20 00 00 00 dc	a.....	202.1.0
21	IN	06	...	203.1.0
21	OUT	02 62 9d 00 43	b.....C	204.1.0
21	IN	06	...	205.1.0
21	OUT	04	...	206.1.0
21	IN	06	...	207.1.0
21	IN	43	C	208.1.0
21	OUT	01 00 ff 00	209.1.0
21	IN	06	...	210.1.0
21	IN	52 41 4b 34 32 30 30 20 76 65 72 73 69 6f 6e 3a 33 2e 32 2e 30 2e 31 34 2e 62 65 74 61 34 0d 0a	RAK4200 version:3.2.0.14.beta4...	211.1.0
21	IN	55 41 52 54 31 20 77 6f 72 6b 20 6d 6f 64 65 3a 20 52 55 49 5f 55 41 52 54 5f 4e 4f 52 41 4d 41	UART1 work mode: RUI_UART_NORAMA	212.1.0
21	IN	4c 2e 20 31 31 35 32 30 20 2e 20 4e 38 31 0d 0a 55 41 52 54 32 20 77 6f 72 6b 20 6d 6f 64 65 3a	L_115200, N81, UART2 work mode:	213.1.0
21	IN	20 52 55 49 5f 55 41 52 54 5f 4e 4f 52 41 4d 41 4c 2e 20 31 31 35 32 30 20 2e 20 4e 38 31 0d 0a	RUI_UART_NORAMA, 115200, N81	214.1.0
21	IN	43 75 72 72 65 6e 74 20 77 6f 72 6b 5f 6d 6f 64 65 3a 4c 6f 52 61 57 41 4e 2c 20 6a 6f 69 6e 5f	Current work mode:LoRaWAN_join	215.1.0
21	IN	6d 6f 64 65 3a 4f 54 41 41 2c 20 4d 75 6c 74 69 63 61 73 74 45 6e 61 62 6c 65 3a 20 66 61 6c 73	mode:OTAA, MulticastEnable: false	216.1.0
21	IN	65 2c 20 43 6c 61 73 73 3a 20 41 0d 0a 49 6e 69 74 69 61 6c 69 7a 61 74 69 6f 6e 20 4f 4b 0d 0a	e, Class: A Initialization OK...	217.1.0
21	IN	0d 0a	...	218.1.0

4. Contact Information

Please contact us if you need technical support or want to know more information.

Document Center: <https://doc.rakwireless.com/>

Resource Downloads: <https://downloads.rakwireless.com>

Forum Supports: <https://forum.rakwireless.com/>

Github: github.com/RAKWireless

Email: info@rakwireless.com

5. Revision History

Revision	Description	Date
1.0	Initial Release.	May 13, 2020
1.1	Add supported modules.	May 15, 2020
1.2	Add software screenshots and notes.	May 22, 2020

6. Document Summary

Prepared by	Checked by:	Approved by:



About RAKwireless:

RAKwireless is a pioneer in providing innovative and diverse Cellular and LoRaWAN connectivity solutions for both Edge and Gateway IoT devices. We believe that through easy to use and modular designs we can accelerate the time to market for various IoT Applications in order to optimize system deployment in both Developer and Commercial settings.