UM12404

RHF4TR03 HHU User Manual

V1.2

Document information

Info	Content
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Abstract	RHF4TR03 HHU User Manual

Content

1 Product Introduction

RHF4TR03 is a new generation handheld Unit which supports Data reading and device control through Reelink protocol and support all the LoRaWAN function，RHF4TR03 HHU use embedded BLE to transport AT command to the host device and LoRaWAN module also.

Mobile Phone APP is offered to make the use of RHF4TR03 easy, it is easy to query and configure the device parameter through APP with a mobile phone，and also upgrade firmware over the air. RisingHF provide only Android version APP. Through mobile phone APP, RHF4TR03 can also work in Reelink-Slave mode, Reelink-Master mode, LoRaWAN mode and in noise scan mode.

1.1 User Interface

① 1*Blue LED:
OFF：Bluetooth deactive
Flash：Bluetooth broadcasting，ready to be connected
Keep ON：Bluetooth connected with Smart Phone
② 1*Red LED:
Flash：LORA module received or respond to a command
③ 4*Green LED:
Sequentially illuminated：Battery charging
4*LEDs Keep ON：Battery full charged
Battery level：
1 LED ON - 25% and below
2 LEDs ON - 50% and below
3 LEDs ON - 75% and below
4 LEDs ON - 100% and below
1 LED Flashing：below 10% alert
④ 1*Button
Press Once：To show battery level
Press twice or more：activate Bluetooth broadcasting
Long press for more than 10 seconds：Reset Device
⑤ Type C USB
- ✓ To charge the battery
- ✓ Can be used for USB communication

1.2 Electrical specifications

Parameter	Min.	Typical	Max.
Charge Voltage	4.6V	5V	6V
Charge Current	50mA	500mA	500mA
Standby Current		83uA	
Bluetooth connected current		8.7mA	
LoRa transmission current		129mA	
LoRa receiving current		15mA	
Battery capacity		750mAh	800mAh
Standby battery life		1Year	
Typical battery life*		48 小时	

Note: *Typical usage: connected to smart phone APP, 4000 devices data reading with Reelink per day.

2 Button

RHF4TR03 Use a button operation to check battery level, activate Bluetooth and reset the device.

Press operation	Function
Press one time	To show battery level
Press twice or more**	activate Bluetooth broadcasting
Long press for more than 10 seconds	Reset Device

**The count of press operation: after the first press operation, user should press next within 5 seconds, the operation count will reset after 5 seconds without any press operation.

2.1 How to know the count of button press operation

Device is not charging：

First press，Green LED will on to indicate the battery level.

Before Green LED off，Press the next operation，will activate the Bluetooth broadcasting. Blue LED will ON.

When charging：

First press will not change any LED status, Green LED will still keep sequentially illuminated.
Press next operation within 5 seconds, will activate the Bluetooth broadcasting. Blue LED will ON.

3 LED Indication

1*Blue LED:
OFF：Bluetooth deactive
Flash：Bluetooth broadcasting，ready to be connected
Keep ON：Bluetooth connected with Smart Phone
1*Red LED:
Flash：LORA module received or respond to a command
4*Green LED:
Sequentially illuminated：Battery charging
4*LEDs Keep ON：Battery full charged
Battery level：
1 LED ON - 25% and below
2 LEDs ON - 50% and below
3 LEDs ON - 75% and below
4 LEDs ON - 100% and below
1 LED Flashing：Below 10% alert

Note：When device reset or powered on, all the LEDs will keep ON for 1 second.

4 Bluetooth

RHF4TR03 support BLE communication with Smart Phone via APP.

Activation method：press button twice，Blue LED will flash for 30 seconds, waiting for connection with Smart Phone.
Broadcasting name：RHF4TR03
Bluetooth broadcast timeout ：30 seconds
Support data command：AT command

4.1 Bluetooth MACADDR

Bluetooth Mac address can be used to identify device, there is a label with QR code on the device.

4.2 How to connect Bluetooth

1）press button twice to activate Bluetooth broadcasting

2) Smart phone use BLE to search Broadcasting name “RHF4TR03” device.

3) After connected, the LED will Keep ON

4) If not connected with smart phone within 30 seconds, RHF4TR03 will stop Bluetooth broadcasting and Blue LED will be OFF.

5 Type C USB

The Type C USB interface is mainly used to charge the battery. In some instance, it can be used as data communication port, to support AT command, firmware upgrade.

5.1 Charge battery

Charging specification：5V 1A

Charging LED indication：

- ✓ Sequentially illuminated：Battery charging
- ✓ 4*LEDs Keep ON：Battery full charged

6 Smart Phone APP User Guide

There is Smart phone APP for RHF4TR03，we call *WiserSquare*, it is developed by RisingHF, for now it has Android version only, please download the Android application package from https://www.risinghf.com/app， and read document <WiserSquare APP User Manual> before use the APP，it will also need an User account and password to use WiserSquare, please contact RisingHF sales for that.

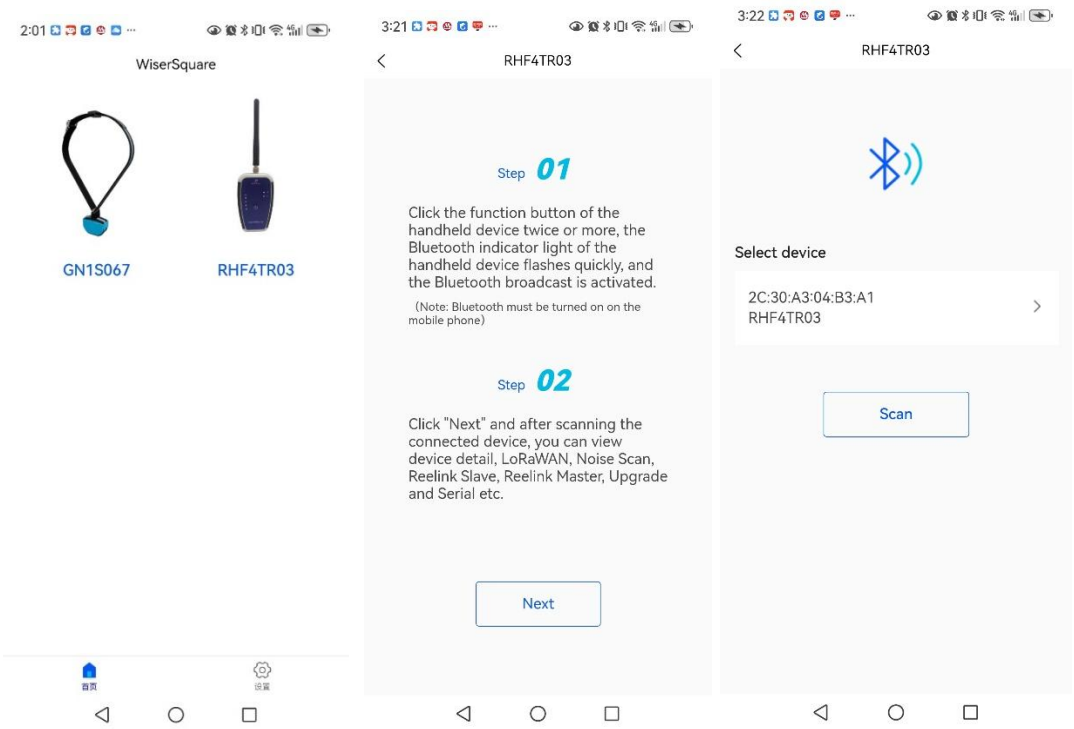
6.1 Activate RHF4TR03 Bluetooth

Activation method：press button twice，Blue LED will flash for 30 seconds, waiting for connection with Smart Phone.

Note that the broadcasting name is “RHF4TR03”，Bluetooth Mac address can be used to identify device, and there is a label with QR code on the device.

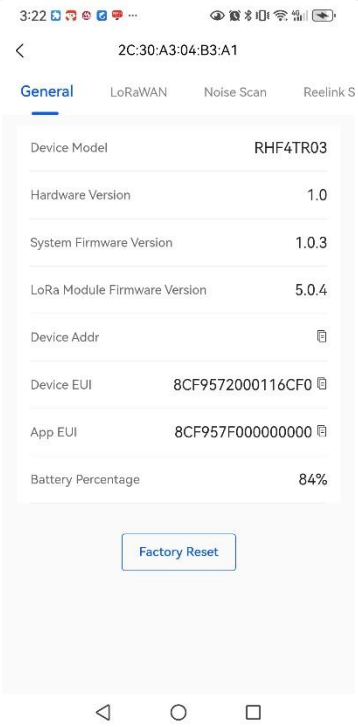
6.2 Connect with smart Phone APP

Open WiserSquare，to select product RHF4TR03， and follow the tips to connect the device，make sure the Bluetooth function is allowed in smart phone settings.



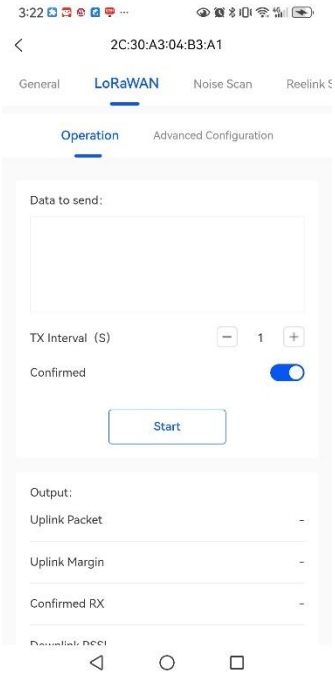
6.3 WiserSquare application User Guide

6.3.1 Device information page



The basic device information page, Pull Down Refresh to check the latest value.

6.3.2 LoRaWAN Mode

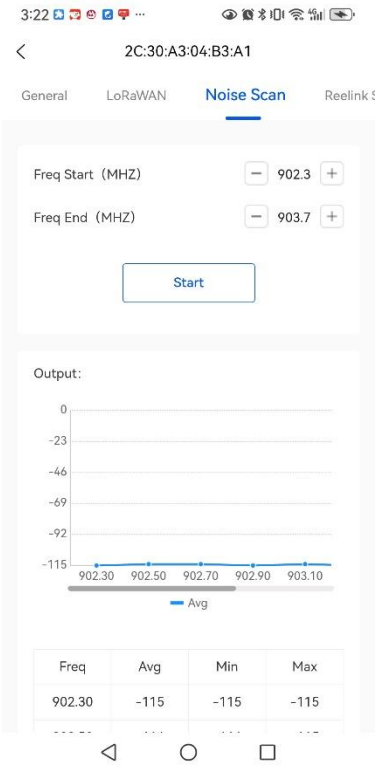


LoRaWAN Mode is used to communicate as an end node device with Gateway，it is useful to evaluate the gateway coverage and range test.

It will be need to register the device first in the LoRaWAN network server. The RHF4TR03 LoRaWAN parameter can be set or queried in the advanced configuration tab.

In WiserSquare APP, all the parameter modification is executed after the edition is done.

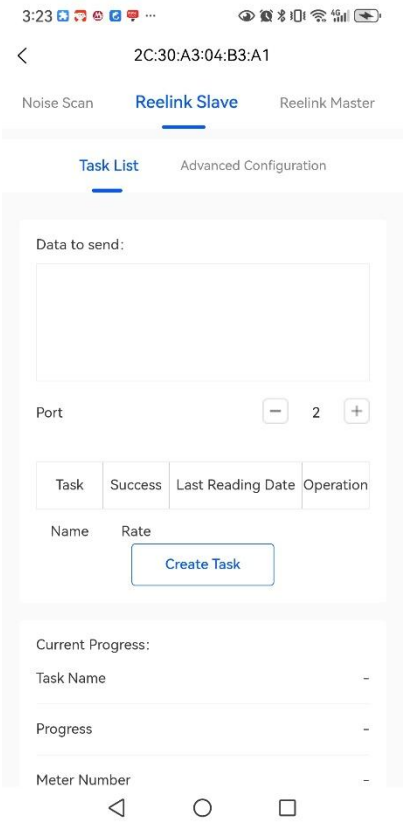
6.3.3 Noise Scan Mode



Noise scan mode is used to check the background noise signal level ，the scan bandwidth is set to 200KHz。

The results is shown in form of chart and graph, the unit is dBm.

6.3.4 Reelink Slave Mode



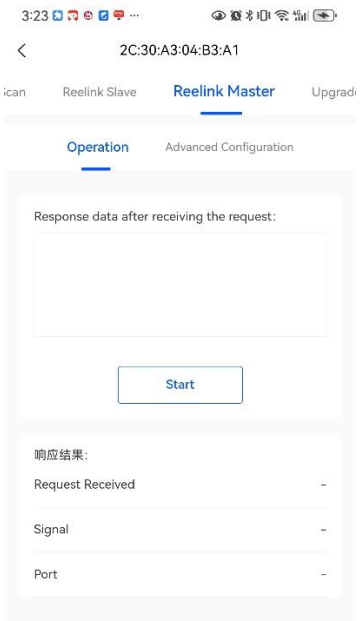
Reelink is a RisingHF defined protocol used to communicate between two LoRa end devices, Reelink allow device to keep fully compatible with LoRaWAN, and in the meanwhile to have the flexible to communicate between Reelink Slave and Master. It is useful in application such as meter reading, parameter configure remotely.

In Reelink Slave mode , RHF4TR03 HHU could create Task to read data of a group device, the read command can be defined by user freely.

Reelink parameter can be set or queried in the advanced configuration tab. Note that the parameter should same as parameter of Reelink master device.

After the task started, Reelink Slave device will read the data of the group devices automatically, and show the real time status all the result data can be stored in the phone memory in the format of excel.

6.3.5 Reelink Master Mode



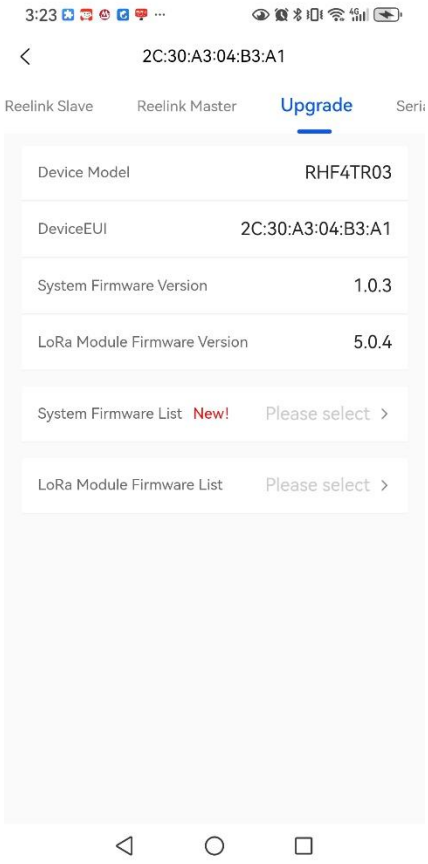
Reelink Master mode is used to communicate with Reelink Slave device，it is normally used for test purpose, not often used in real case.

Reelink parameter can be set or queried in the advanced configuration tab. Note that the parameter should same as parameter of Reelink slave device。

In Reelink Master mode, RHF4TR03 will respond and reply the preset data after received the request from Reelink Slave device.

The response data can be edited in the input area.

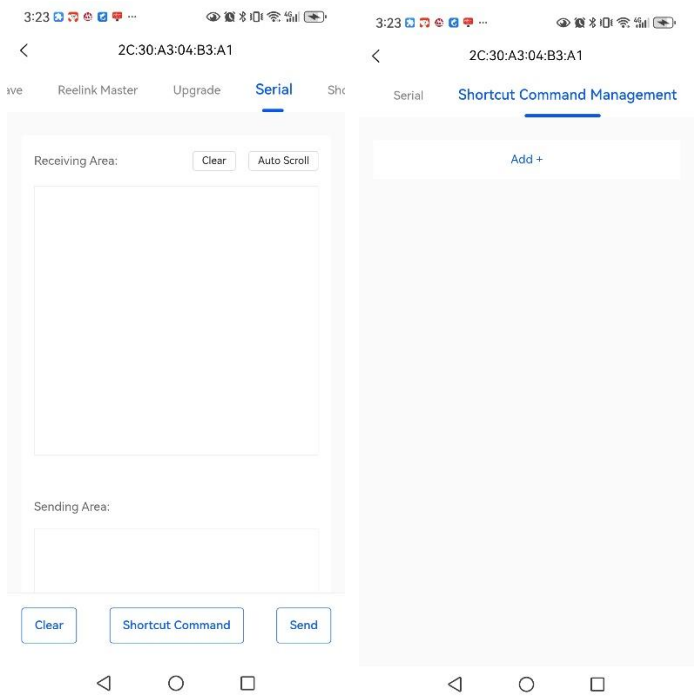
6.3.6 Firmware upgrade



Firmware upgrade，when system detect new version firmware, user can operate to upgrade the firmware over the air.

For LoRa module firmware upgrade, after the upgrade process done, please long press the button for 10 seconds to reset the RHF4TR03.

6.3.7 Serial Port Debug Tool



Serial Port debug tool is used for debug purpose, user can send any AT command in this area.

It is not often used in real case.

7 Secondary Development Guide

Normally APP WiserSquare can meet all the application need for the RHF4TR03.

This Chapter is aim for user who want to do Secondary Development.

7.1 Interaction method

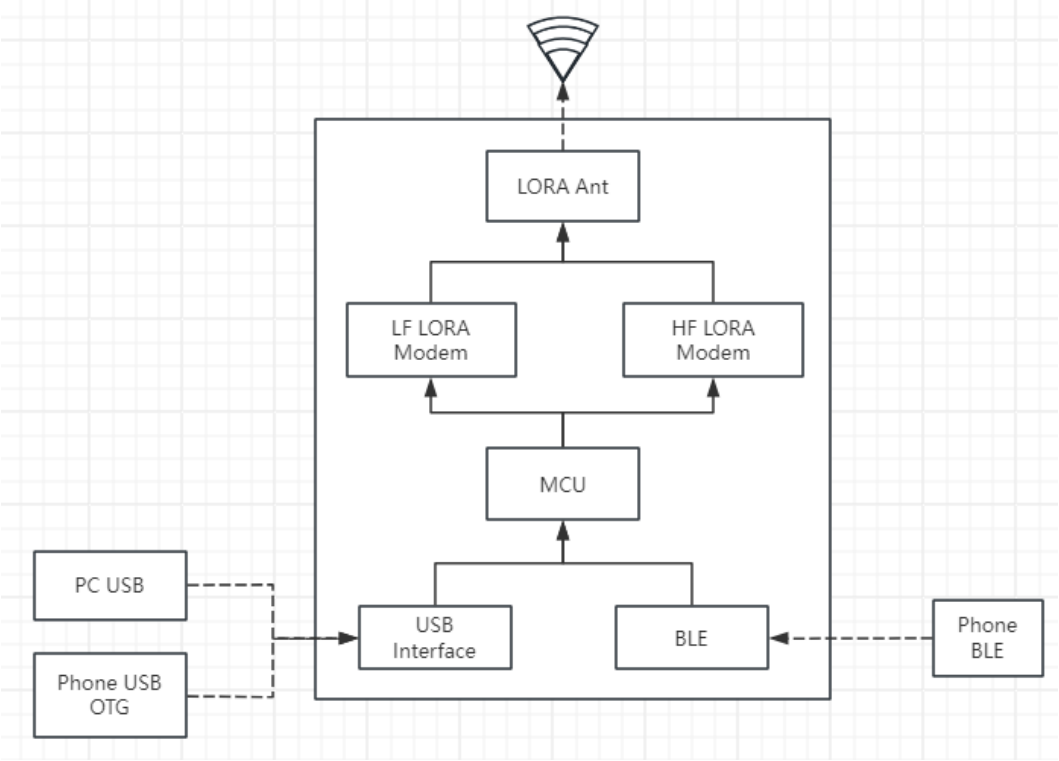
RHF4TR03 support BLE communication with Smart Phone via APP.

Note that the broadcasting name is “RHF4TR03”，Bluetooth Mac address can be used to identify device, and there is a label with QR code on the device.

Support interaction method：AT command.

There are two kinds of AT command，one kind is LoRa Module AT Command，this part is dominant.

The other kind interact directly with RHF4TR03 main MCU，they are listed in chapter 7.3.2.



7.2 Switch working LoRa Module

There are two LoRa modules inside RHF4TR03, one is for low frequency band 434~510MHz, the other one is for high frequency band 780~960MHz.

Switch AT command:

Low frequency band：AT+HHUMODULE=LF

High frequency band：AT+HHUMODULE=HF

7.3 AT Command List

RHF4TR03 and LoRa module is in sleep mode, please add extra header to wake up the device or module.

Wakeup header：\xff\xff\xff

suffix：\r\n

for example：\xff\xff\xff AT+HHUVER=FULL\r\n

7.3.1 LORA Module AT Command

Support all《[RHF-PS01709]LoRaWAN Class ABC AT Command Specification v1.3.pdf》AT command.

Support all《[RHF-PS020951]LoRaWAN RiLink AT Command SpecificationV1.3.pdf》Reelink AT command.

7.3.2 RHF4TR03 System AT Command

This kind command interact directly with RHF4TR03 main MCU, they are all with prefix “HHU”.

RHF4TR03 System AT Command list：

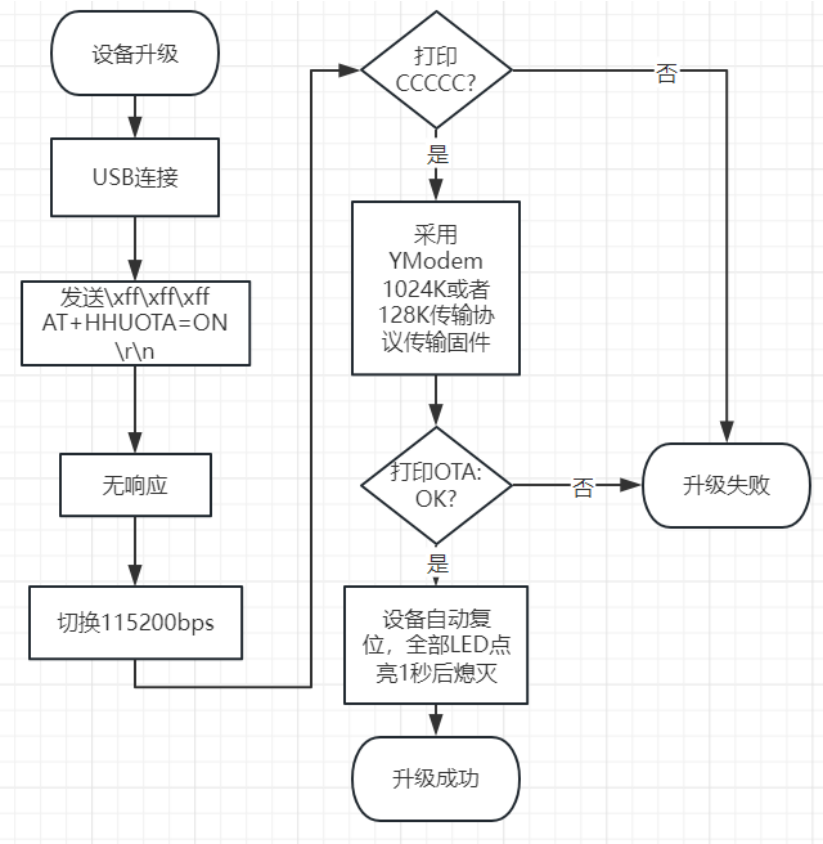
Function	AT command	Response
Firmware version query	AT+HHUVER	+HHUVER: 1.0.1
Firmware version full query	AT+HHUVER=FULL	+HHUVER: 1.0.1, 1.0, "RHF4TR03", "Jan 10 2024 10:07:14"
RESET	AT+HHURESET	+HHURESET: OK
Debug log ON	AT+HHULOG=ON	+HHULOG: DEBUG
Debug log OFF	AT+HHULOG=OFF	+HHULOG: QUIET
Power Voltage query	AT+HHUVDD	+HHUVDD: Core:3.29V Batty:4.10V
Battery level query	AT+HHUBAT	+HHUBAT: LEVEL 93%
RTC time query	AT+HHURTC	+HHURTC: 2000-01-01 00:08:21
Enable HHU firmware upgrade	AT+HHUOTA=ON	Null (print garbled code)
Current Working LoRa module query	AT+HHUMODULE	+HHUMODULE: LF/HF
Set Working LoRa module	AT+HHUMODULE=LF	+HHUMODULE: LF
Set Working LoRa module	AT+HHUMODULE=HF	+HHUMODULE: HF
Enable LF LoRa module firmware upgrade	AT+HHUUPGRADE=LF	+DFU: ON
Enable HF LoRa module firmware upgrade	AT+HHUUPGRADE=HF	+DFU: ON
Bluetooth MAC address query	AT+HHUBLE=MACADDR	+HHUBLE: MacAddr, 94:4F:A3:04:B3:A1
Set Bluetooth MAC address	AT+HHUBLE=MACADDR, <6 Bytes Hex> AT+HHUBLE=MACADDR, 001122334455	+HHUBLE: MacAddr, 00:11:22:33:44:55
Restore to factory default settings	AT+HHUFDEFAULT	+HHUFDEFAULT: OK

7.4 Firmware Upgrade

7.4.1 RHF4TR03 system firmware upgrade

Firmware file：rhf4tr03-vx.x.x-yyyymmdd-ota.ebin.bin

example：rhf4tr03-v1.0.1-20240105-ota.ebin.bin

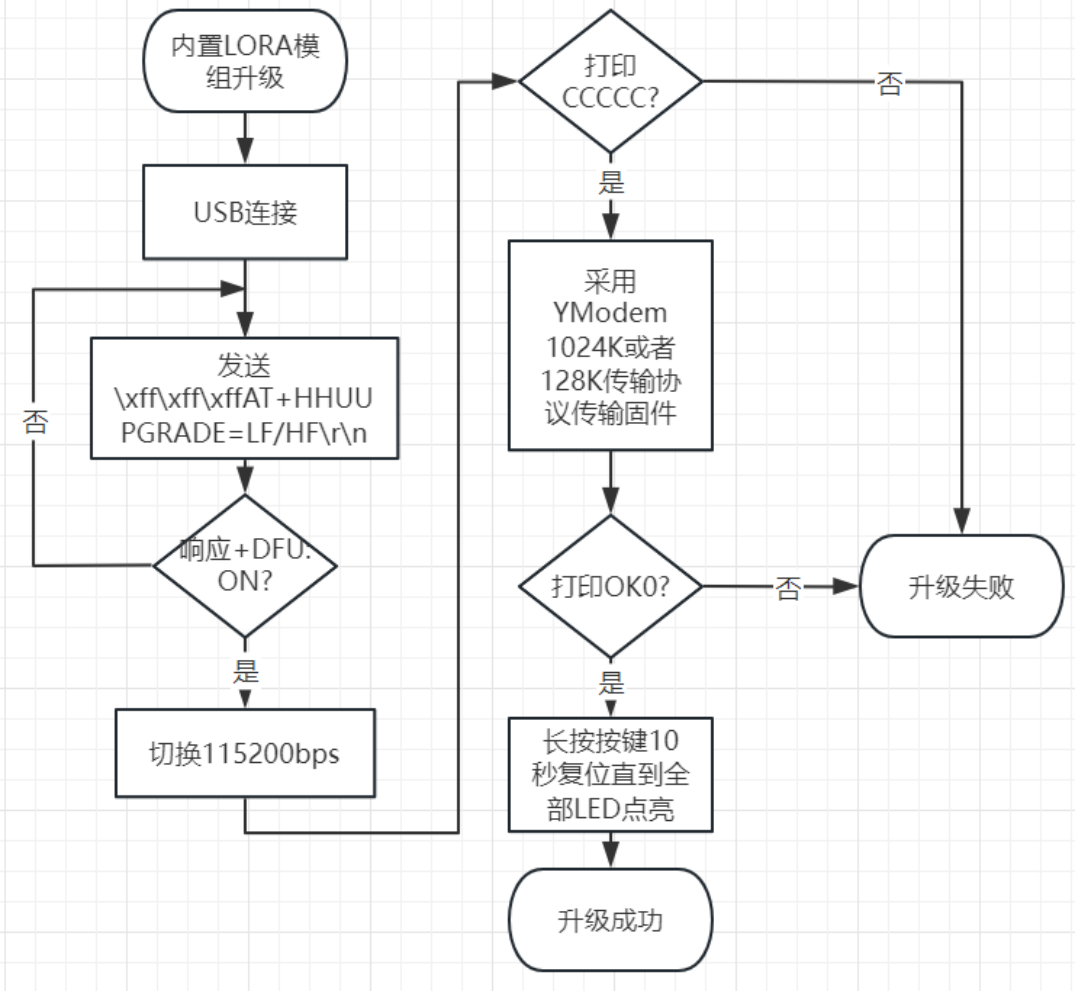


7.4.2 LORA Module Firmware Upgrade

Firmware file：rhf0m055-rilink-vx.x.x-yyyymmdd.ebin.bin

example：rhf0m055-rilink-v5.0.4-20230713.ebin.bin

After the upgrade process done, please long press the button for 10 seconds to reset the RHF4TR03.


内置LORA模组升级
USB连接
发送\xff\xff\xffAT+HHUUPGRADE=LF/HF\r\n
响应+DFU:ON?
否
是
切换115200bps
打印CCCCC?
否
是
采用YModem 1024K或者128K传输协议传输固件
打印OK0?
否
是
升级失败
长按按键10秒复位直到全部LED点亮
升级成功

Revision

V1.2 2024-6-25
+add note that RHF4TR03 APP is Android version only.

V1.1 2024-5-9
+update the product Appearance

V1.0 2024-01-11
+Create

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