

UM01705

LoraWan RHF3M485 User Guide

V0.3

Document information

Info	Content
Keywords	<i>RisingHF, RS485, User Guide, LoraWan, RHF3M485</i>
Abstract	This document is used to describe how to use RHF3M485

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1 Introduction

DFU (Data Forward Unit) RHF3M485 is a transparent transmission device form high isolation RS485 and RS232 to LoRaWAN transceiver which is designed by RisingHF. And the device integrates all LoRaWAN bands such as CN470, EU433, EU868, US915, AS923, AU915, KR920 and so on, and supports CLASS A and C.



Figure 1-1 RHF3M485 outline

2 Descriptions

The function of the indicator LED and the interface for configuration is described as follows:

Note: The LoRa LED and FCT LED are two-color LED, but Pwr LED is a monochromatic LED.

LoRa	<ul style="list-style-type: none"> ■ When the module is in firmware upgrade mode, the red and green light flashes alternately. ■ When the module is in installation mode, the LED is used to indicate the strength of the signal quality (see Chapter 5 for details). ■ When the module is in normal operation: The red light flashes once, indicating the module has received a data. The green light flashes once, indicating the module sends a data.
FCT	<ul style="list-style-type: none"> ■ When the module is in installation mode, the red and green LED flashes alternately ■ When the module is in normal operation, the LED is powered off
Pwr	<ul style="list-style-type: none"> ■ LED on, indicating the normal power supply equipment. ■ LED off, indicating the equipment is not normally powered.
RF	RF port
Configure	<p>Parameter configuration port and firmware upgrade port. Used to configure LoRaWAN related parameters and parameters related to data transmission (see Chapter 4 for details). Firmware upgrade (see Chapter 6 for details); Based on the distance to the antenna, the order of the three interfaces is TX, RX, GND from far to near.</p>
DC IN 6-48	Power input port
RS232	Wired communication port. RS232 and RS485 are alternated. Please do the configuration before using it.
RS485	Wired communication port. RS232 and RS485 are alternated. Please do the configuration before using it.

3 Quick start

3.1 Power on:

Input DC 6~48V to the device with an adapter. When the Pwr LED is on the device is powered normally.

3.2 Configure basic parameters:

Please use a USB to UART tool to connect the device to the PC. And then open a serial port tool (for example, SSCOM) on the PC. Serial port configuration: Baud rate 9600, Bit 8, stop bit 1, no parity bit. Take care of the pin definition (TxD, RxD and GND) of the configuration port.

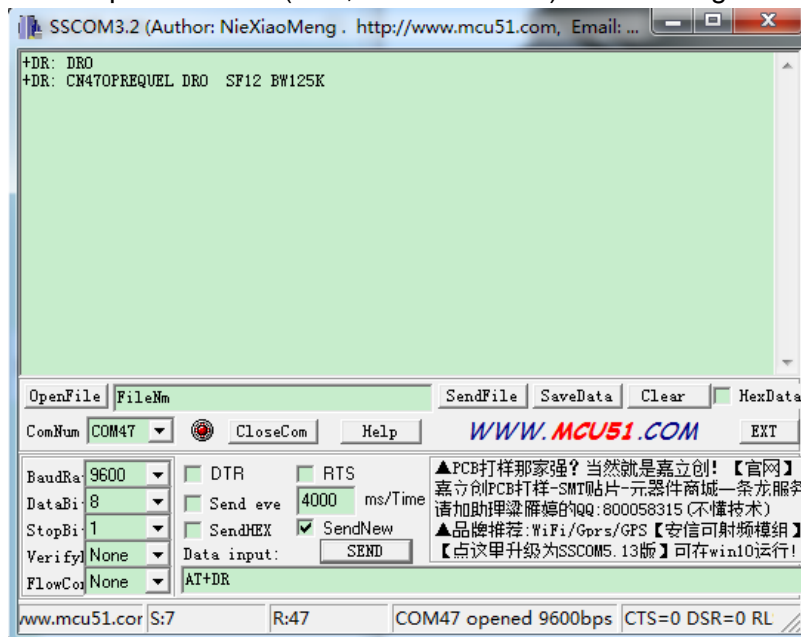


Figure 3-1 SSCOM tool for configuration

Several key parameter quick setting steps are as follows:

- (1) Set the frequency plan

Input: AT+DR

Used to query the current default frequency plan

Return:

+DR: DR0

+DR: CN470PREQUEL DR0 SF12 BW125K

Indicate that the current frequency plan is CN470PREQUEL.

If changed to CN470.

Input: AT+DR=CN470

Return after successful:

+DR: CN470

- (2) Configure RS232/485

Input: AT+UARTDFU

Used to query the current serial port configuration information for terminal device communication

Return:

+UARTDFU: 2400,1,8

Indicate that the baud rate of the current communication port is 2400, odd parity bit (0: no parity bit, 1: odd parity; 2: even parity), and data bit 8.

Refer to below to modify the baud rate to 9600.

Input: AT+UARTDFU=9600, 2, 8

Return after successful:

+UARTDFU: 9600, 2, 8

(3) Select RS485 or RS232

Input: AT+COMMODE

Used to query the current connection mode

Return:

+COMMODE: RS485

Indicate that the current connection mode with terminal is RS485

If change to RS232

Input: AT+COMMODE=RS232

Return after successful:

+COMMODE: RS232

3.3 Register the current device on the server

After the basic parameters are configured, you can choose ABP mode or OTAA mode and register it on the network server.

Input: AT+ID

Query the current DevAddr/DevEui/AppEui of the module.

Return:

+ID: DevAddr, 00:6D:C2:03

+ID: DevEui, 47:68:C4:0A:00:38:00:49

+ID: AppEui, 52:69:73:69:6E:67:48:46

And the default KEY include NWKSKEY, APPSKEY and APPKEY are all "2B7E151628AED2A6ABF7158809CF4F3C"

Below is an example to show how to register the device as ABP mode on the Loriot server:

- 1) Input a device with the right devaddr/appskey/nwkskey on the server.
- 2) Choose Class C and set the receiver window as RX2 on the server.

3.4 Enter the installation mode

After the configuration for both node and server side, the module will start working.

If you want to enter the the installation mode, to select the ideal location of the module, you must press and hold the boot button for at least 4s until the FCT blinks red and green alternately (refer to Chapter 5 for details).

If you do not need to enter the site installation mode, skip this step directly to enter the fifth step.

When module running, you can always enter the installation mode.

3.5 Connect to terminal device

Connect the RHF3M485 to terminal device via RS485 or RS232 interface.

Note that the serial port configuration of the terminal module is the same as the configuration parameters in (2) in 3.2 above. Otherwise, the data is not correct even if normal communication is possible.

4 Parameter Configuration

The serial port of the parameter configuration is located on the "Configure" side, as shown in the figure:



Figure 4-1 Configuration port

The device default frequency plan is CN470PREQULE, you can use AT + DR to view the current frequency plan, and modify it.

For the parameter configuration of LoRaWAN, please follow the document [RHF-PS01509]LoRaWAN Class AC AT Command Specification - v4.3.

The following instructions are used for RHF3M485 transparent module to configure the module:

RS485/232 serial port parameters configuration	AT+UARTDFU	Query instructions, The default baud rate 2400, odd parity, data bit 8
	AT+UARTDFU=9600,0,8	Configuration instructions, Eg: configured to baud rate 9600, no parity, data bit 8
Timeout in receiver window of the module	AT+TIMEOUT	Query instructions, The default value is 1, corresponding to the timeout is 8s
	AT+TIMEOUT=2	Configuration instructions, Eg: Configured to 2, corresponding to the timeout 10 0x00:6s; 0x01:8s; 0x02:10s; 0x03:12s; 0x04:14s; 0x05:16s; 0x06:18s; 0x07:20s;
Module heartbeat cycle	AT+PERIOD	Query instructions, Default value is 2, equal to 2 minutes
	AT+PERIOD=3	Configuration instructions, Eg: Configured to 3 min
Whether the module data is uploaded with confirmed type	AT+CONFIRM	Query instructions, Default value is 0: Indicate to upload unconfirmed type data
	AT+CONFIRM=1	Configuration instructions, Eg: Configured to 1, indicates that upload the last sub-packet with confirmed type
Whether the module uploads the time stamp of the data packet sent by the terminal device	AT+SENDTS	Query instructions, Default value is 0, not upload
	AT+SENDTS=1	Configuration instructions, Eg: Configured to 1, upload the time stamp
Configure the communication interface between the module and the terminal device	AT+COMMODE	Query instructions, Default value is RS485
	AT+COMMODE=RS485	Configuration instructions, Eg: Configured to RS232

When the terminal equipment is connected with RS485, it must be set to RS485 mode with AT command. If it is set to RS232, RHF3M485 module will not receive the data sent by the terminal equipment. And when the terminal equipment is connected with RS232, it must be set to RS232 mode with AT command. If it is set to RS485, RHF3M485 module will not receive the data sent by the terminal equipment.

5 Installation Mode

This mode is used to help users to install the equipment on site, providing guidance and references on the pros and cons of the location.

After the device is powered on normally, you can enter the installation guide mode by using the boot button. You must press and hold the boot button for at least 4s to trigger the installation mode. The FCT LED starts flashing alternately means the device is in installation mode.

In this mode, the Lora bi-color light is used to indicate the current signal strength as shown below:

Lora LED red flash	The current signal is weak
Lora LED green flash	The current signal is relatively strong
Lora LED green light on	The current signal is strong
Lora LED light off	The current equipment is poorly installed and cannot receive signals

When you have selected the installation location of the device in installation mode, you must press the boot button for at least 4 seconds again to exit the installation guide mode and enter the normal operation mode. At this time, the FCT light will not flash. At any time it can enter the site installation guide mode.

Note that after using this mode, you must manually exit from this mode, otherwise it will affect the normal use!

6 Upgrade

When you need to upgrade the device application FW, long press and hold the round button on the power side, then power on. If the LORA indicator flashes red and green alternately, the device has entered the upgrade mode, and then you can release the button.

After entering the upgrade mode, refer to the document “[RHF-UM01518] How to upgrade RisingHF device v1.2” to upgrade the application. After the upgrade is successful, you must re-power the device to return to normal operation mode, and then use the AT command to check or configure the parameters.

7 Note

Due to the hardware limitation of DFU, the maximum length of the data to be transmitted from terminal to DFU(RHF3M485) cannot exceed 500 bytes. Otherwise, the DFU will only take the first 500 bytes. There is a 2Kbytes buffer space inside the module, which means the DFU could only keep 4x500 bytes maximum in the buffer. So when the terminal sends data fast, the buffer will be filled quickly, and then it is normal that some old data will be covered and instead of by the new data.

Revision

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+ errata

V0.2 2017-07-12

+Add the Quick Start Chapter (Chapter 3)

+Add the Installation Mode Chapter (Chapter 5)

V0.1 2017-05-31

+ Creation

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