

AN-106 LoRa tester



——LoRa tester specification sheet

Product name: LoRa tester

Product model: AN-106

Version: V1.4

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1. Product introduction

With the development of low power long range RF technology, especially LoRa technology launched by Semtech becomes more and more mature, Winext Technology have launched LoRa tester AN-106 based on LoRa module. AN-106 LoRa tester is with LCD screen and connect with gateway via OTAA network joining. It can test the UPLINK and DOWNLINK packet loss rate and meanwhile users can get RSSI and SNR of gateway transmission. Users can also turn on the GPS to display the latitude and longitude coordinates of the device, and check the LoRoWAN CLASS type and the firmware version number of the LoRa tester.

2. Product feature

- ✧ Support LoRa wireless communication , support CN470-510MHz/868MHz/915MHz ;
- ✧ Support GPS locating with the accuracy of within 5M;
- ✧ With built-in lithium battery can support the system for 36 hours;
- ✧ With LCD screen, which can support text interface display;
- ✧ Full plastic shell structure design;
- ✧ Wide working temperature range, to achieve industrial -20°C~+70°C;
- ✧ Support real-time communication with gateway, can get RSSI and SNR of gateway transmission;
- ✧ Support statistics of packet loss rate of communication between gateway and nodes.

3. Product image



4. Product application

- ✧ Smart city communication management system
- ✧ Smart community communication management system
- ✧ Smart Agriculture communication system
- ✧ Smart transportation communication system

5. Technical parameter

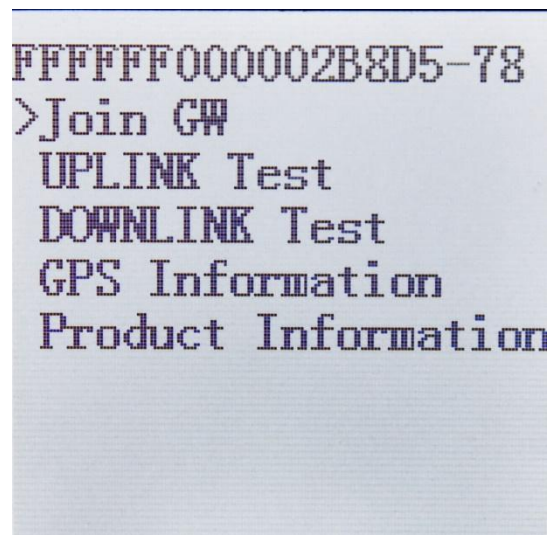
Technical parameter	CPU	ARM 32bit-Cortex-M3 kernel; Main frequency: 32MHz
	Memory	128KB Flash 16KB RAM 4KB EEPROM
Hardware parameter	Sensor	built-in GPS
	Buzzer	Built-in
	LED indicator	1x power indicator, red 1x charging indicator, green
	Antenna	External LoRa antenna, Built-in GPS ceramic antenna
Wireless parameter	Data rate	300bps~5.4Kbps
	Working frequency	470MHz~510MHz 863MHz~870MHz 902MHz~928MHz
	Protocol	Support LoRaWAN
	Maximum transmitted power	17dbm
	Rx sensitivity	-140dBm
Electrical specification	Overall power consumption	110mW
	Battery capacity	3.7V/3500mAh
	Working temperature	-20°C ~ 70°C
	Working humidity	10% ~ 90%
DC specification	Power supply	built-in rechargeable lithium battery
	Input voltage	DC3.7V
	Transmit status	150mA
Physical parameter	IP grade	IP65
	Dimension	190*86*30mm

6. Operating instruction

6.1. Key instruction

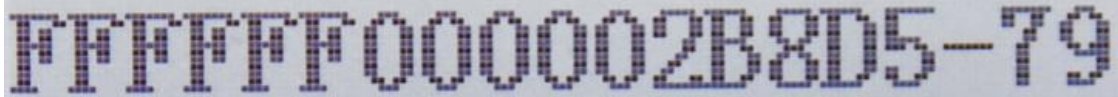
- There are total 5 function keys and a ON/OFF key;
- Function keys are: left key, right key, up key, down key, OK key, ON/OFF key
- Right key/left key: return the function menu at the previous level
Up key/Down key: choose up and down;
The ">" at the beginning, displays the chosen function menu
- OK key: to enter the function menu, perform the function of the function menu

6.2. Main menu page



- The 1st line: display DevEui & battery capacity;
- The 2nd line: OTAA network joining;
- The 3rd line: UPLINK Test;
- The 4th line: DOWNLINK Test;
- The 5th line: GPS information;
- The 6th line: Product information

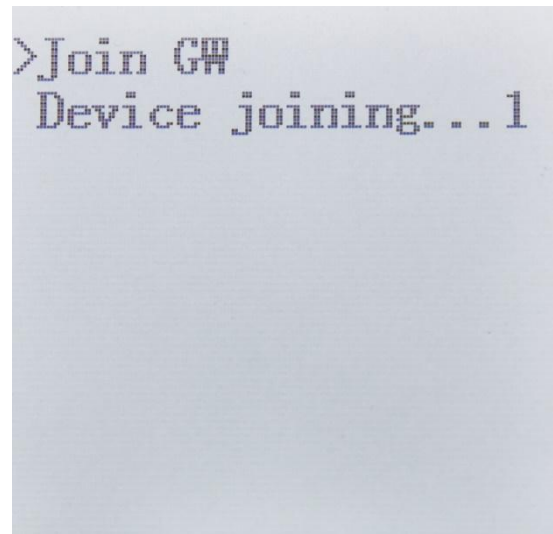
6.2.1. Display DevEui & battery capacity



```
FFFFFFFF000002B8D5-79
```

6.3. OTAA network joining

6.3.1. Apply for joining network



```
>Join GW  
Device joining...1
```

- The 2nd line: display device joining, and the number shows the times of this request;
- Only in this menu can you send OTAA network joining request; It will stop the sending of the network joining request after exiting the function menu
- After sending OTAA network joining request, in the time of Join accept delay 2, if you exit the function menu, you can still get the incoming confirmation message from the gateway.
- The device will always send the request to the network until it is successful.

6.3.2. Network joining success

```
>Join GW
Device has joined
DevAddr:C39DB507
```

- The 2nd line: display “device has joined”
- The 3rd line: display the IP address assigned by gateway

6.4.UPLINK test

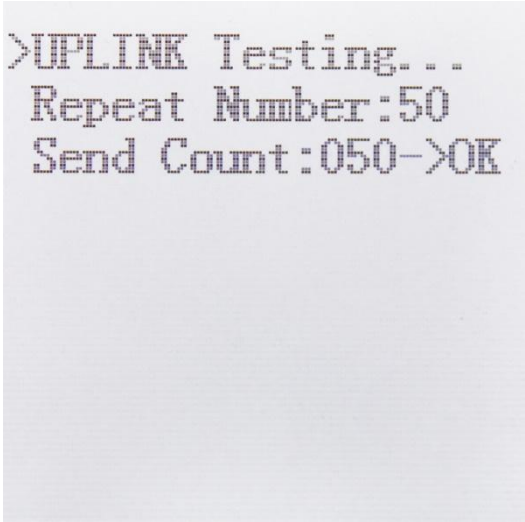
6.4.1. Interface description

```
>Start UPLINK Test
Get UPLINK PLR
TxFreq:476100000Hz
TxDataRate:SF12
TxPower:20dBm
Package Size:10Byte
Repeat:50
Interval:0s
```

- The 1st line: press Enter to start UPLINK Test;
- The 2nd line: press Enter to get UPLINK packet loss rate;
- The 3rd line: press Enter to adjust the communication frequency when doing UPLINK test;
- The 4th line: press Enter to adjust the spreading factor when doing UPLINK test;
- The 5th line: press Enter to adjust the Tx power when doing UPLINK test;

- The 6th line: press Enter to adjust the package size when doing UPLINK test;
- The 7th line: press Enter to adjust the testing number when doing UPLINK test;
- The 8th line: press Enter to adjust the sending interval when doing UPLINK test.

6.4.2. Do UPLINK testing

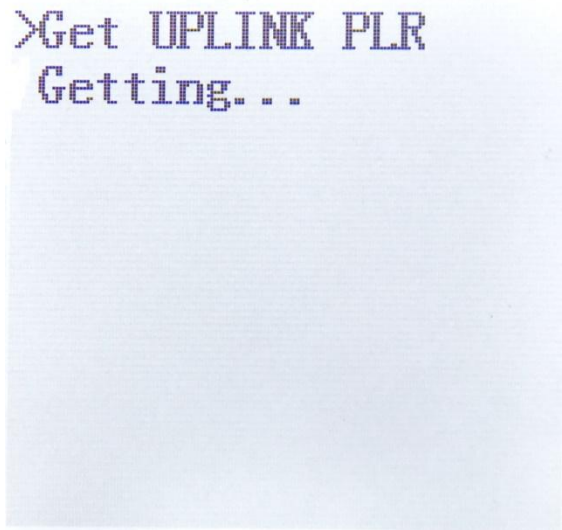


```
>UPLINK Testing...  
Repeat Number:50  
Send Count:050->OK
```

Note: When Send Count and Repeat Number are the same, that means the testing is finished.

- The 2nd line: display the repeat number of the testing;
- The 3rd line: display the send count of the current testing, and “OK” shows the sending succeeds; “Failure” shows the sending fails.

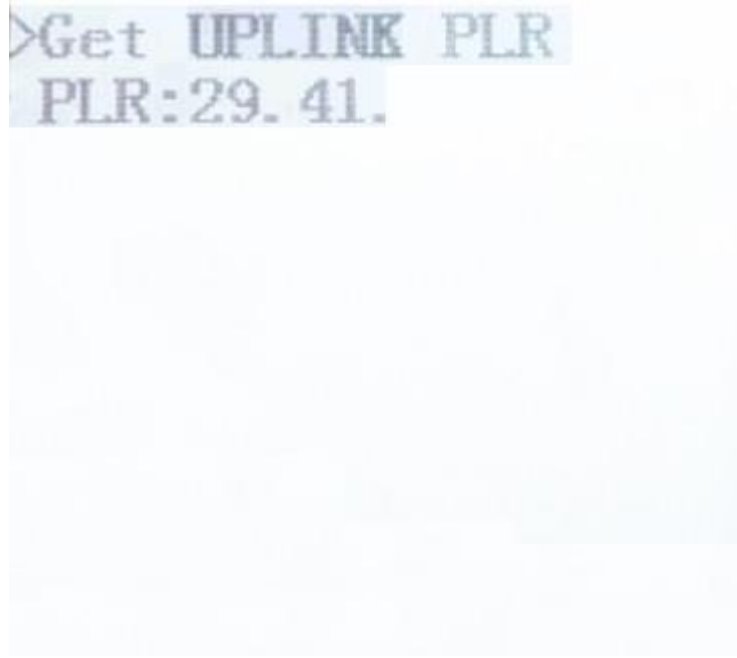
6.4.3. Get UPLINK packet loss rate



```
>Get UPLINK PLR  
Getting...
```

Note: the above picture shows UPLINK packet loss rate getting

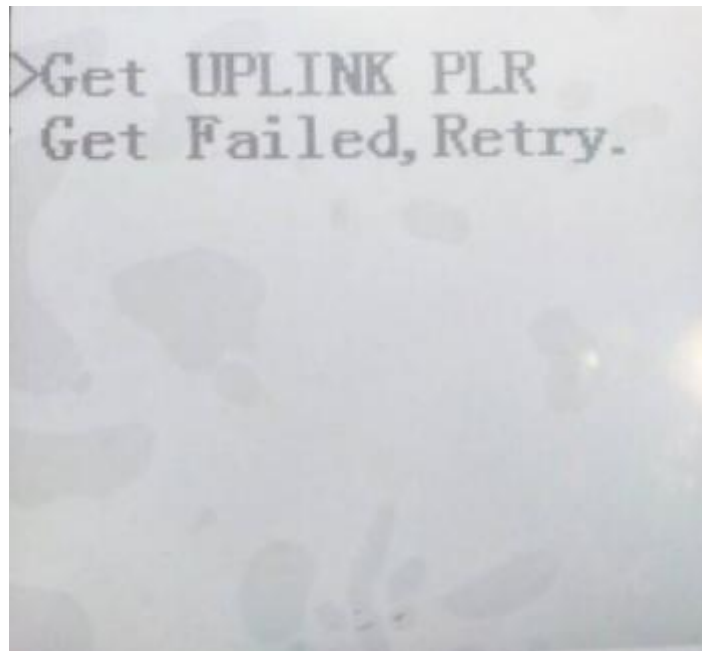
6.4.4. Get UPLINK packet loss rate success



```
>Get UPLINK PLR  
PLR:29.41.
```

Note: the value of packet loss is shown after successfully obtaining UPLINK packet loss rate. In above picture, the value 29.41 of PLR, which is the packet loss rate.

6.4.5. Get the UPLINK packet loss rate failed



Note: if get the UPLINK packet loss rate failed, you can retry.

6.5. DOWNLINK test

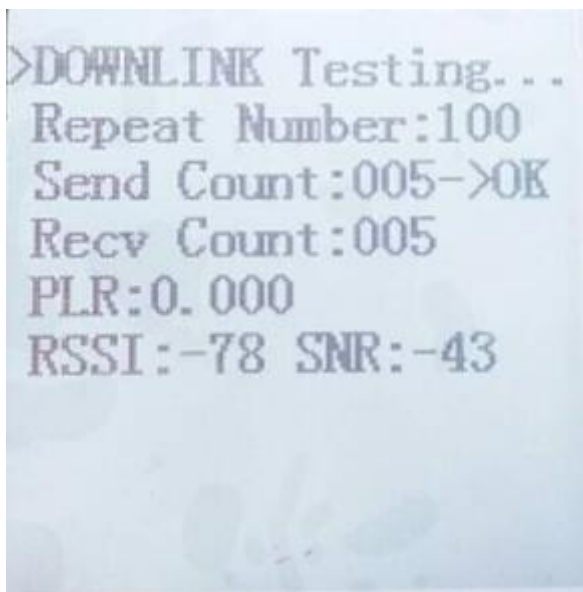
6.5.1. Interface description

```
Start DOWNLINK Test
TxFreq:476300000Hz
TxDataRate:SF11
TxPower:14dBm
Repeat:100
>Interval:5s
Buzz:OFF
```

- The 1st line: start DOWNLINK Test menu, press “Enter” to this interface;
- The 2nd line: display the communication frequency in DOWNLINK test, press Enter key to adjust;
- The 3rd line: display the spread factor in DOWNLINK test, press Enter key to adjust;
- The 4th line: display the transmit power in DOWNLINK test, press Enter key to adjust;

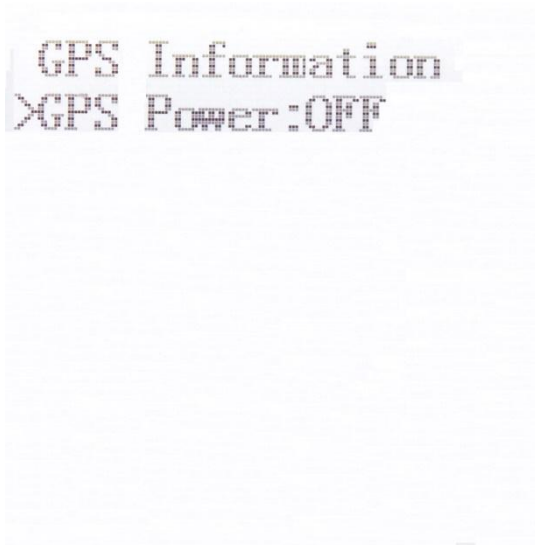
- The 5th line: display the testing repetition during DOWNLINK test, press Enter key to adjust;
- The 6th line: display the delivery interval in DOWNLINK test, press Enter key to adjust;
- The 7th line: display the buzzer switch to remind when receiving DOWN package in DOWNLINK test, press Enter key to adjust.

6.5.2. Start DOWNLINK test



- The 2nd line: display the testing repetition;
- The 3rd line: display the sending repetition of current test, here, the “OK” indicates that the sending succeed, “FAIL” indicates the sending failed;
- The 4th line: display the receiving repetition of DOWNLINK packet from server;
- The 5th line: PLR is for Packet Loss Rate, here 0.000 is the current packet loss rate of DOWNLINK test, the packet loss rate will be refreshed after each test;
- The 6th line: display the RSSI and SNR value of DOWNLINK packet from gateway;
- The RSSI and SNR value will be cleaned each time when sending packet during DOWNLINK test;
- When Send Count is the same as Repeat Number, it means that you’ve completed the testing.

6.6. GPS Information



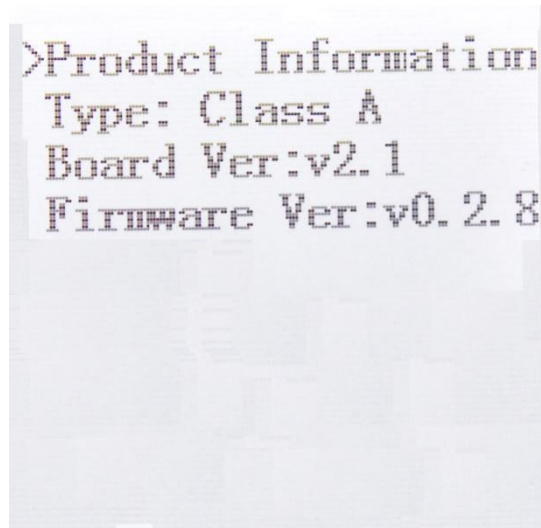
Note: the 2nd line shows the function menu of the GPS power switch, and by pressing the Enter key to do ON/OFF switching, the above picture shows the GPS power supply to be off, and no GPS information is displayed.

```
GPS Information
>GPS Power:ON
Lat: +22.520182
Lon: +114.039347
Alt: +42m
```

Note: After starting the GPS power switch by pressing Enter key, it takes about a few minutes of searching time. The above picture shows the GPS power to turn on and the GPS information is displayed.

- The 3rd line: shows latitude;
- The 4th line: shows longitude;
- The 5th line: shows altitude.

6.7. Product information

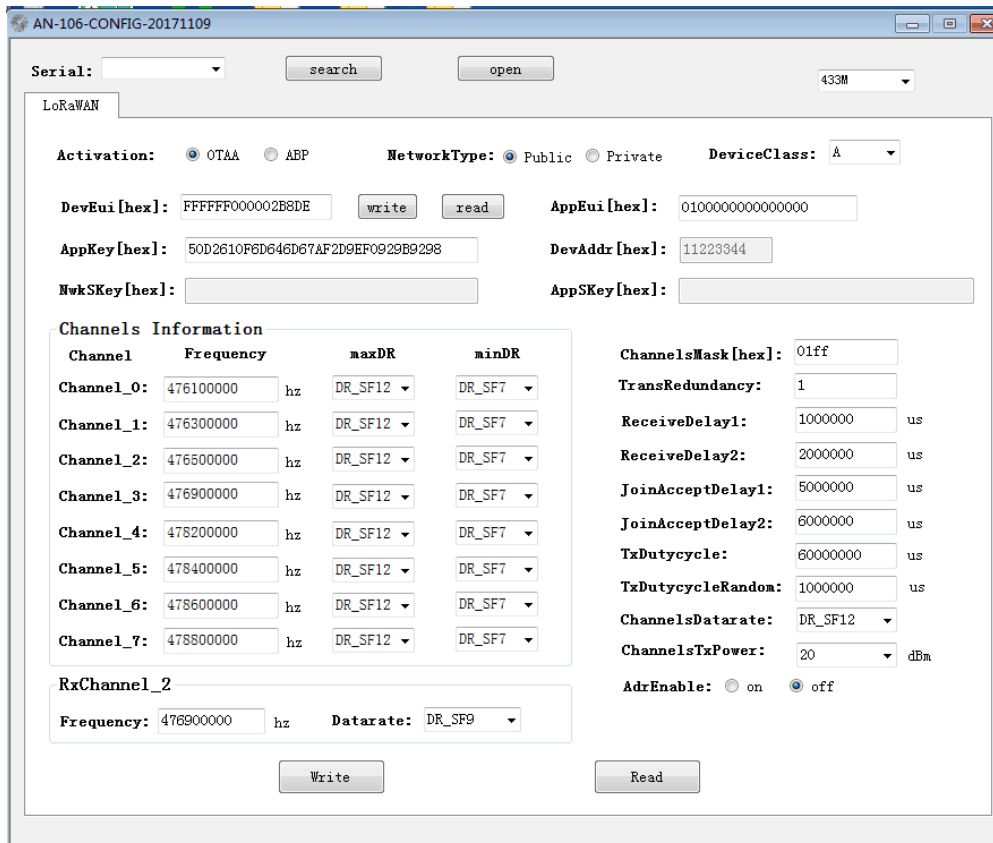


- The 2nd line: shows the type of LoRaWAN(Class A, B,C) the LoRa tester use;
- The 3rd line: shows the main board version of the LoRa tester;
- The 4th line: shows the firmware version of the LoRa tester.

7 . Parameter configuration methods and steps

The 1st step: Install the driver of the LoRa tester by connecting with micro USB;

The 2nd step: Open configuration software (AN - Config) , show as below:



AN-106-CONFIG-20171109

Serial: search open 433M

LoRaWAN

Activation: OTAA ABP NetworkType: Public Private DeviceClass: A

DevEui [hex]: FFFFFFF000002B8DE write read AppEui [hex]: 0100000000000000

AppKey [hex]: 50D2610F6D646D67AF2D9EF0929B9298 DevAddr [hex]: 11223344

NwkSKey [hex]: AppSKey [hex]:

Channel	Frequency	maxDR	minDR
Channel_0:	476100000 hz	DR_SF12	DR_SF7
Channel_1:	476300000 hz	DR_SF12	DR_SF7
Channel_2:	476500000 hz	DR_SF12	DR_SF7
Channel_3:	476900000 hz	DR_SF12	DR_SF7
Channel_4:	478200000 hz	DR_SF12	DR_SF7
Channel_5:	478400000 hz	DR_SF12	DR_SF7
Channel_6:	478600000 hz	DR_SF12	DR_SF7
Channel_7:	478800000 hz	DR_SF12	DR_SF7

RxChannel_2

Frequency: 478900000 hz Datarate: DR_SF9

ChannelsMask [hex]: 01ff

TransRedundancy: 1

ReceiveDelay1: 1000000 us

ReceiveDelay2: 2000000 us

JoinAcceptDelay1: 5000000 us

JoinAcceptDelay2: 6000000 us

TxDutyCycle: 60000000 us

TxDutyCycleRandom: 1000000 us

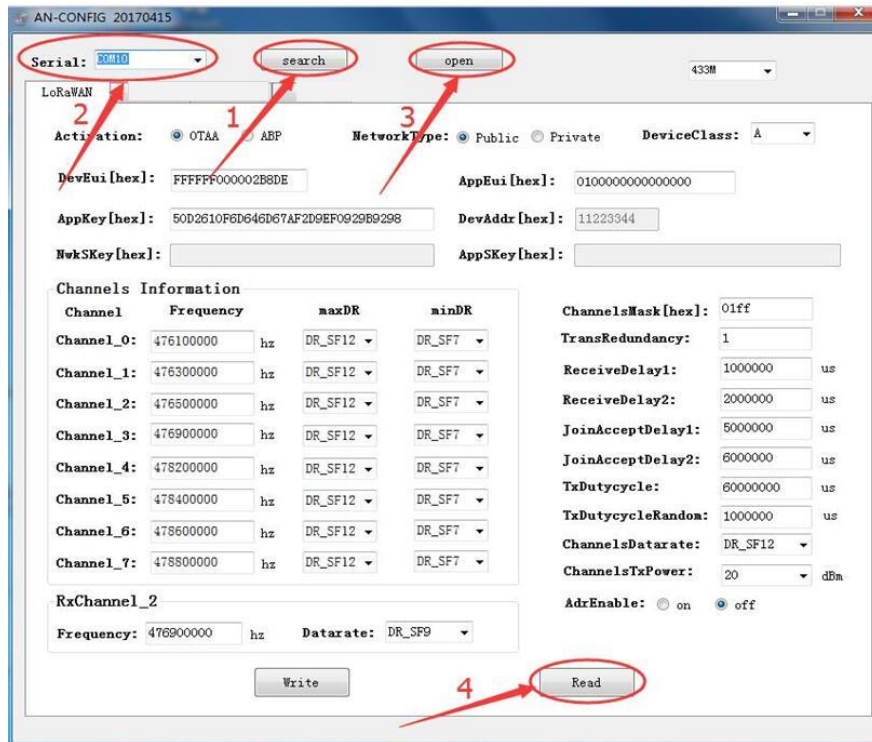
ChannelsDatarate: DR_SF12

ChannelsTxPower: 20 dBm

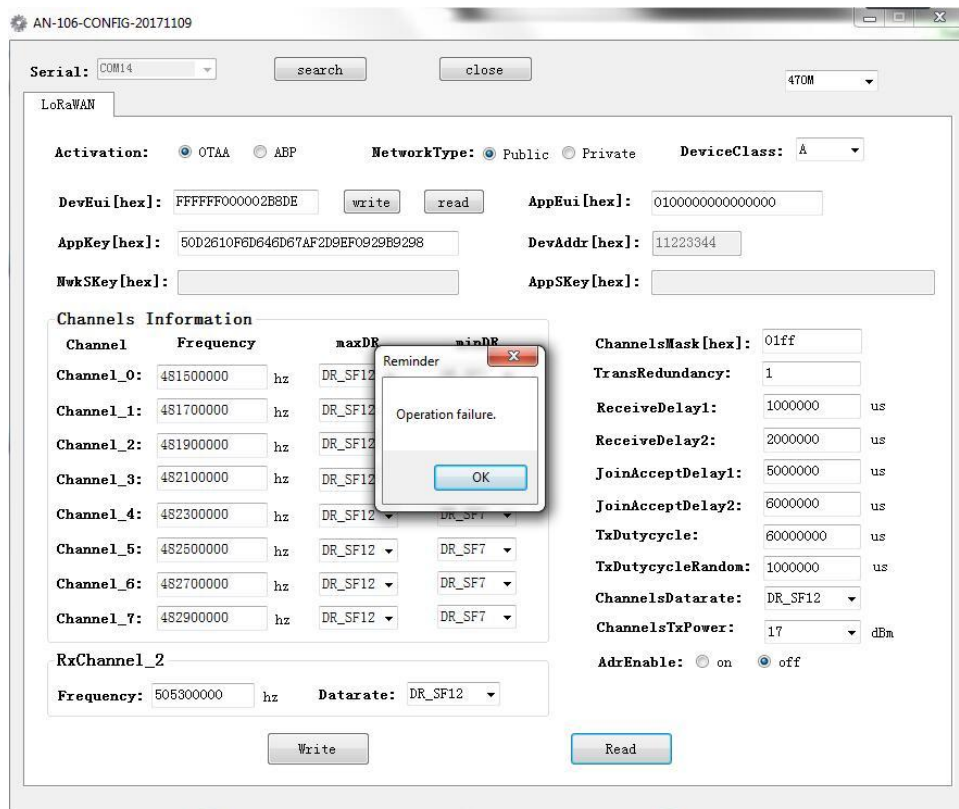
AdrEnable: on off

Write Read

The 3rd step: in the main interface of the configuration tool, click “search” button, select the corresponding port number of “Serial”, then click “OPEN” button, finally, click “Read” button, show as below:

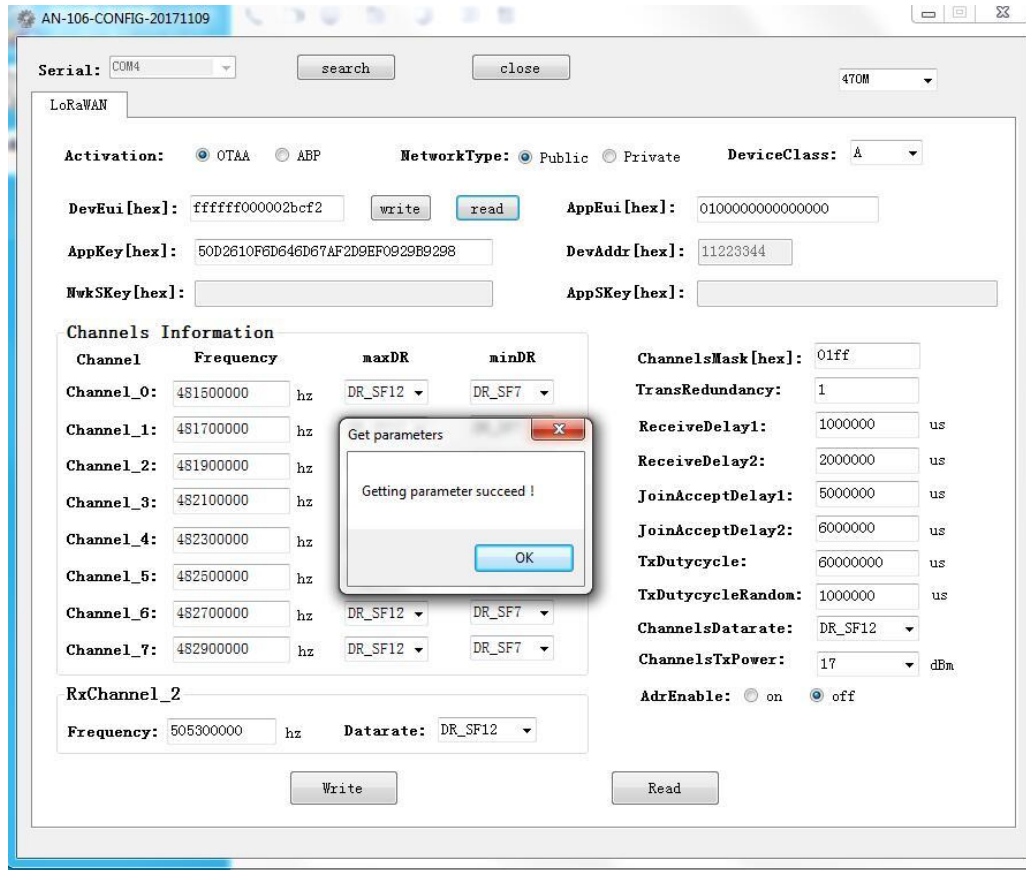


The 4th step: The prompt window will pop up if the read is successful. If unsuccessful, the prompt window prompts “operation failure”.

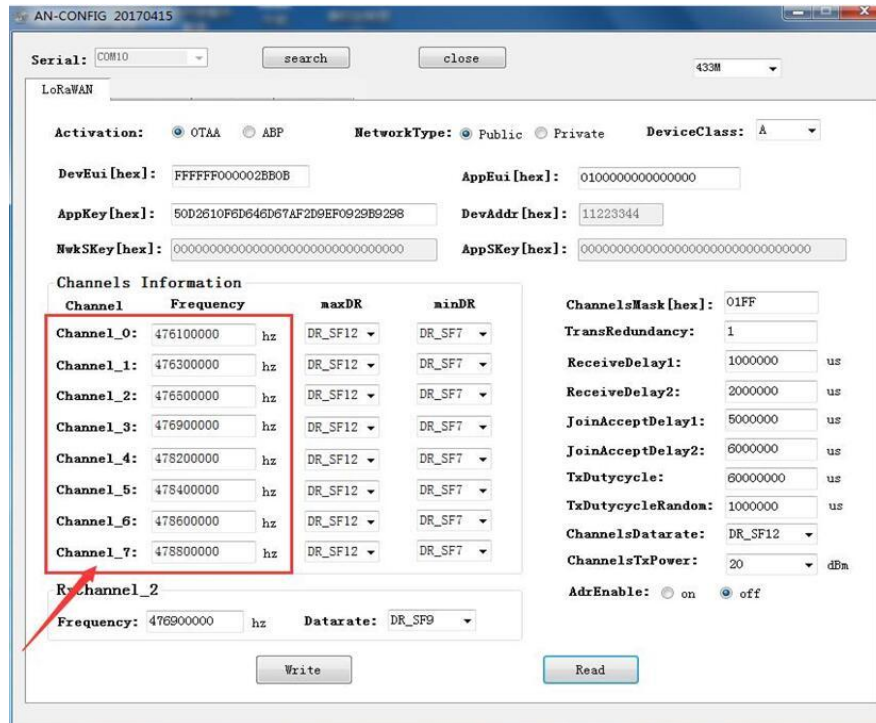


If the read unsuccessful, you need to reconnect the USB Serial line and restart the operation of the 3rd step, and pay special attention to the corresponding port number of "Serial". If the read succeeds, the prompt window prompts for "getting parameter succeed".

show as below:



The 5th step: After clicking the "ok" button, modify the frequency point parameter of the "Channels Information" in the main interface of the configuration tool, and the frequency point parameter must be modified to be consistent with the gateway frequency point parameter. As below:



After finishing modification of parameter, click "Write" to save.

Note: Pls make sure that the frequency parameters should be consistent with the gateway frequency parameters, otherwise, it can not join network and can not communicate with the gateway.

8 . Attention

- 8.1 The LoRa tester should be turn off in the absence of use for a long time;
- 8.2 Pls make sure that the frequency parameters should be consistent with the gateway frequency parameters, otherwise, it can not join network and can not communicate with the gateway.