RD Tool Usage Document

Revision	Release Date	Summary
1.0	2021/5/31	Initial draft
2.0	2021/10/13	Update the tool interface

Table of Content

1. General Description

This tool is developed for the convenience of ECR6600 project and subsequent projects, for the use of R & D engineers. It mainly includes firmware download, Flash, NV and RF related operations and other core functions.

2. Function Introduction

2.1 Download

2.1.1 Single File Download

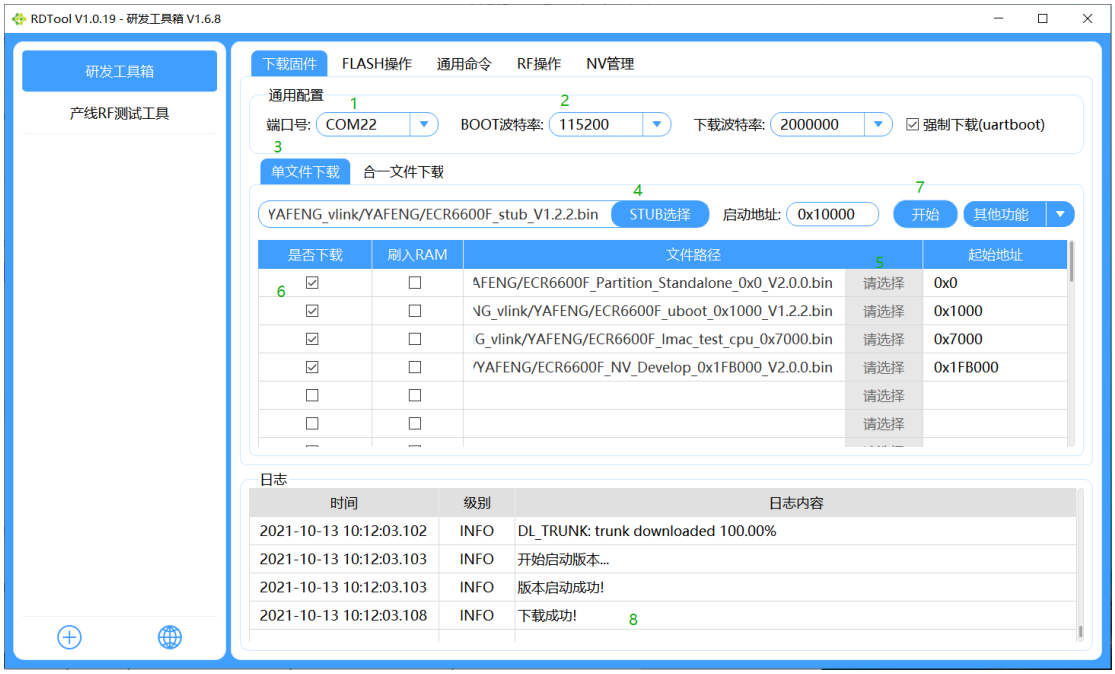
Please follow the ICONS in the following image to operate in order. During the operation, the following points should be noted:

[Whether to Download]: The option determines whether or not to download the file in this download. **[Download to RAM]:** The option indicates whether to download the file into the RAM. If not checked, it will be downloaded into the Flash.

The tool will analyze the address in the file name and fill it in automatically, So it's better to put address information on the file name;

Forced download mode (uartboot) will switch the chip into UART mode before downloading, and switch the chip into FLASH mode after downloading successfully. This function requires hardware cooperation.

After select a Stub firmware, it can start downloading. The list of downloaded files can be empty.



When downloading the firmware, the chip need to switch to UART mode, that is, BOOTMODE0=1, BOOTMODE1=0; The ResetB of the chip needs to be connected to the RTS of the serial chip. After downloading the firmware successfully, power off the chip and switch to the SPI-Flash mode, that is, BOOTMODE0=0, BOOTMODE1=0;

Step1: Select port number;

Step2: Select boot baud rate, 115200 ;

Step3: Select single file download;

Step4: Select firmware with stub suffix names;

Step5: Select firmware other than stub, and the address fills automatically;

Step6: Tick whether or not to download, automatically tick by default;

Step7: Click to start;

Step8: The successful download on the tool interface indicates that the version has been downloaded successfully

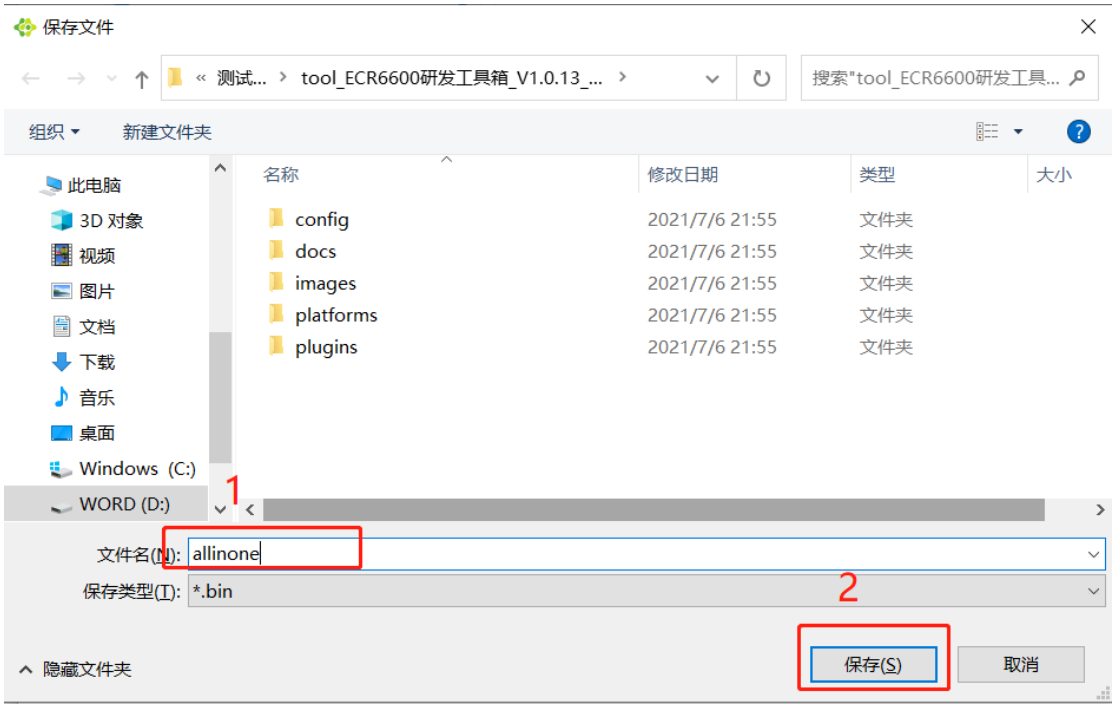
2.1.2 All-In-One File Generation

Please operate according to the sequence of ICONS in the following figure. The synthesized file is an All-In-One BIN file. During the operation, the following points should be noted:

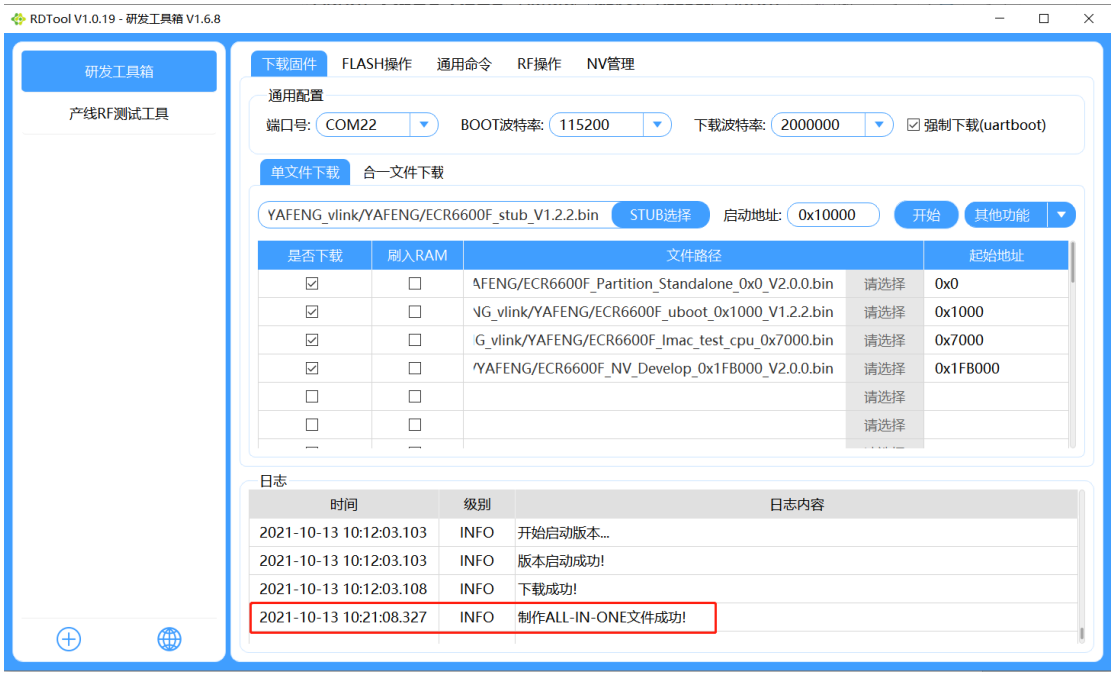
The tool will analyze the address in the file name and fill it in automatically, So it's better to put address information on the file name;

When making synthesized file, select files according to 2.1.1 step4 and 2.1.1 step5, and select making synthesized file from other functions;

Select the path and name to save the synthesized file in the pop-up folder, then save it.



After the synthesis is successful, the tool will print “make an All-In-One file successful”.



2.1.3 Synthesized File Download

Please operate according to the sequence of ICONS in the following figure. During the operation, the following points should be noted:

When downloading the synthesized firmware, the chip need to switch to UART mode, that is, BOOTMODE0=1, BOOTMODE1=0; The ResetB of the chip needs to be connected to the RTS of the serial chip. After downloading the firmware successfully, power off the chip and switch to the SPI-Flash mode, that is, BOOTMODE0=0, BOOTMODE1=0;

Step1: Select port number;

Step2: Select boot baud rate, 115200;

Step3: Select synthesized file download;

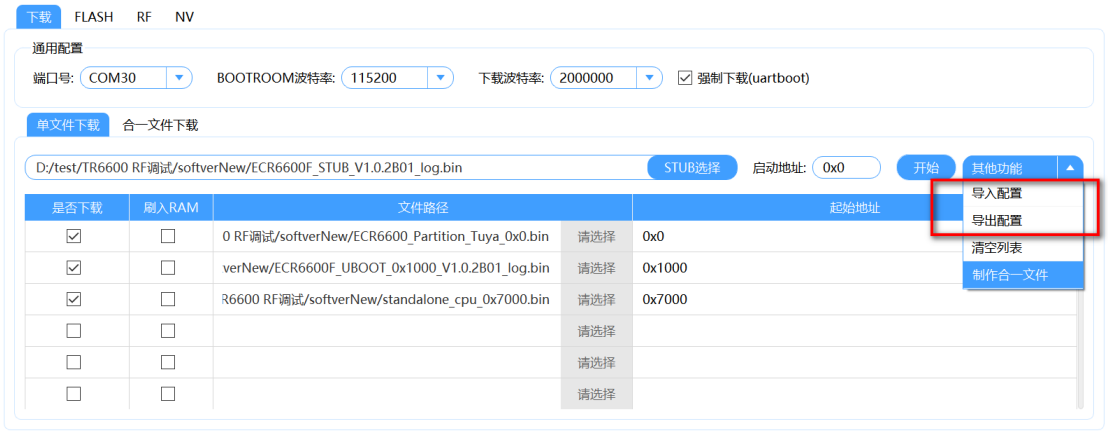
Step4: Select the synthesized firmware from the file path without selecting the address;

Step5: Click to start;

Step6: The successful download on the tool interface indicates that the version has been downloaded successfully

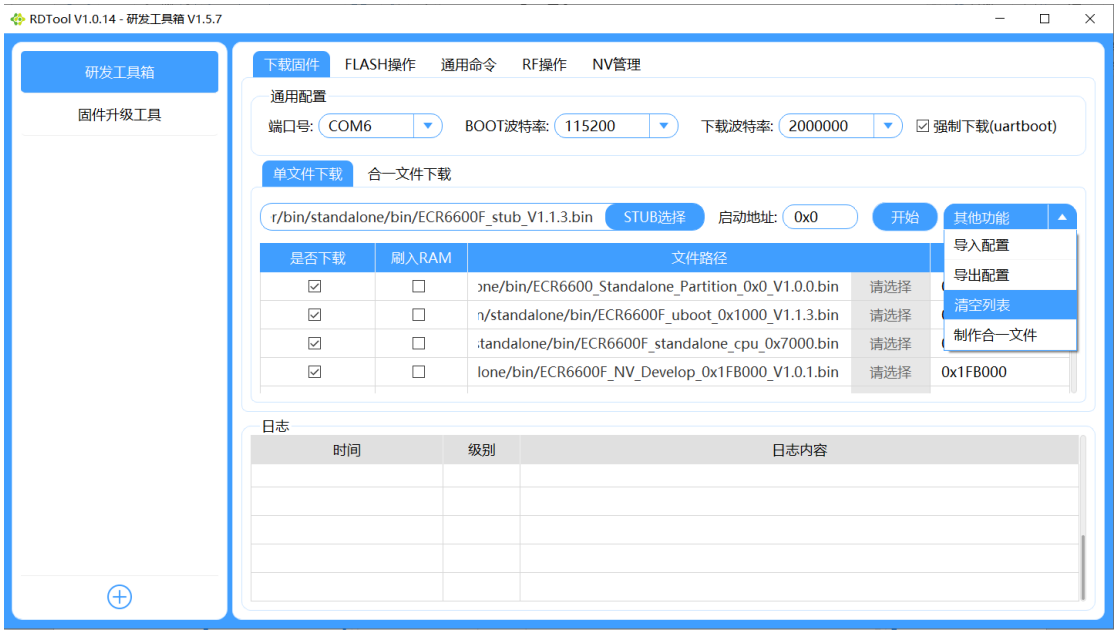
2.1.4 Import and Export Configuration

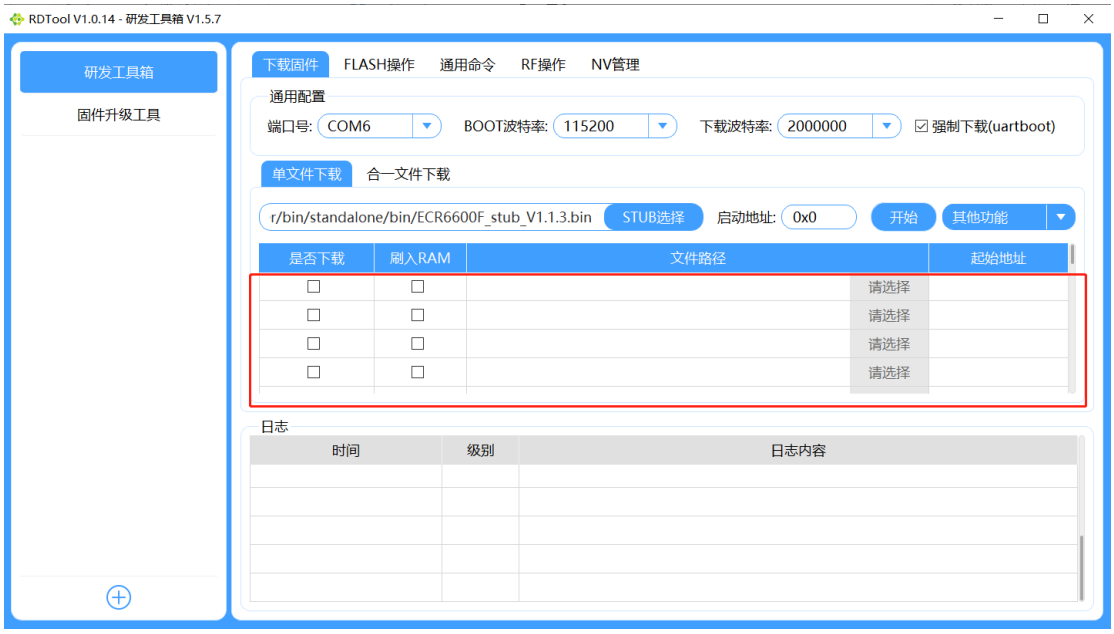
This function is designed mainly to facilitate the user to save the editing scene, in order to prepare for the next quick recovery of application scenarios such as: research and development has multiple sets of compilation environment, in order to download different versions, need to frequently cut back and forth compilation environment; When needs multiple versions of the authentication and to locate the problem, requiring multiple versions of the configuration to switch authentication back and forth.



2.1.5 Empty the list

This function can quickly clear the edit list, easy to change different series of files for download.

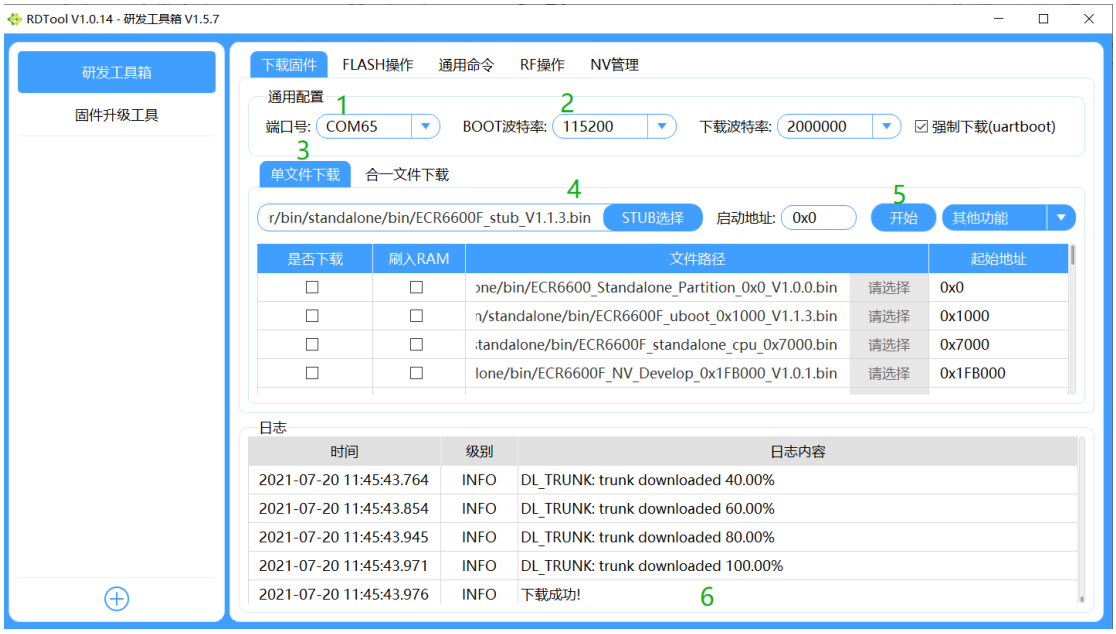




2.2 Flash operation

2.2.1 Flash data upload

Flash upload is the reverse operation of Flash download. What needs special attention is: The normal working version does not include the Flash upload function. It needs to download a STUB file to be used as the upload agent. Of course, Flash data uploading also requires switching to UART mode.



Step1: Select port number;

Step2: Select boot baud rate, 115200;

Step3: Select single file download;

Step4: Select firmware with stub suffix names;

Step5: Click to start;

Step6: The successful download on the tool interface indicates that the version has been downloaded successfully

The chip continues to power, switch the tool to the Flash operation interface:

Step7: Select port number;

Step8: Select boot baud rate;

Step9: Enter the starting address of the firmware;

Step10: Enter the length of the flash to read (hexadecimal);

Step11: Select the path and name to save the synthesized file in the pop-up folder, then save it.

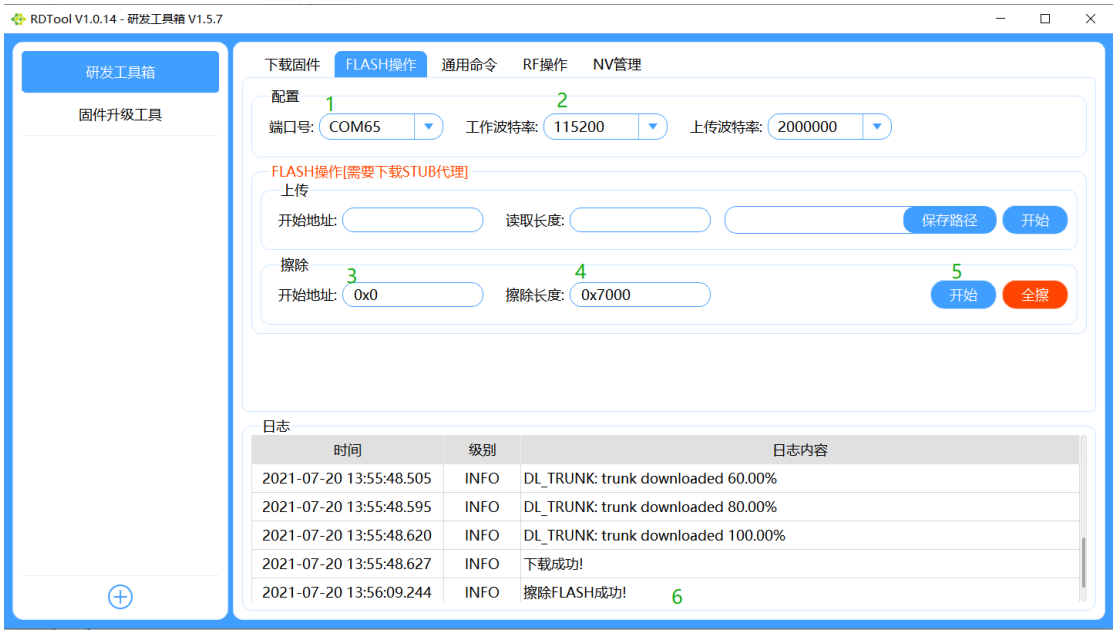
Step12: Click to start;

Step13: After a successful read of flash, the tool will display a successful read of flash;

2.2.2 Flash Data Erasure

Partial Erase

Flash erasure is the manual erasure of part of the Flash area, which can be the part of the downloaded version of Flash, or the blank part of the unstored version of Flash. What needs special attention is: The normal working version does not include the Flash erasure function, it needs to download a STUB file to be used as the upload agent; Of course, Flash data erasing also requires switching to UART mode.



After download a STUB file, switch the tool to the Flash operation interface;

Step1: Select port number;

Step2: Select boot baud rate;

Step3: Enter the starting address for erasure

Step4: Enter the length to be erased

Step5: Click to start;

Step6: After successful erasure, the tool will show that the erasure of flash was successful;

Full Erased

Flash erase is for the convenience of troubleshooting problems, in the case of the operator does not know the length of the FLASH, one key to clear all the data on the FLASH. What needs special attention is: The normal working version does not include the Flash full erase function, it needs to download a STUB file to be used as the upload agent; Of course, Flash data erasing also requires switching to UART mode.

After download a STUB file, switch the tool to the Flash operation interface;

Step1: Select port number;

Step2: Select boot baud rate;

Step3: Click erase all;

Step4: After a successful erasure, the tool will show that the erasure all flash was successful;

3. General Command

The software is the “IOT version” after startup. When testing RF, the chip need to switch to “AMT version”.

3.1 Switch Version

Step1: Select the general command interface of the RD Tool;

Step2: Select port number;

Step3: Select boot baud rate;

Step4: Click “OPEN” to open the COM port;

Step5:When switching versions, click the “default version(默认版本)” or “AMT version(AMT 版本)”;

Step6: Click on the “Execute”;

Step7: The tool will show that switch version successfully;

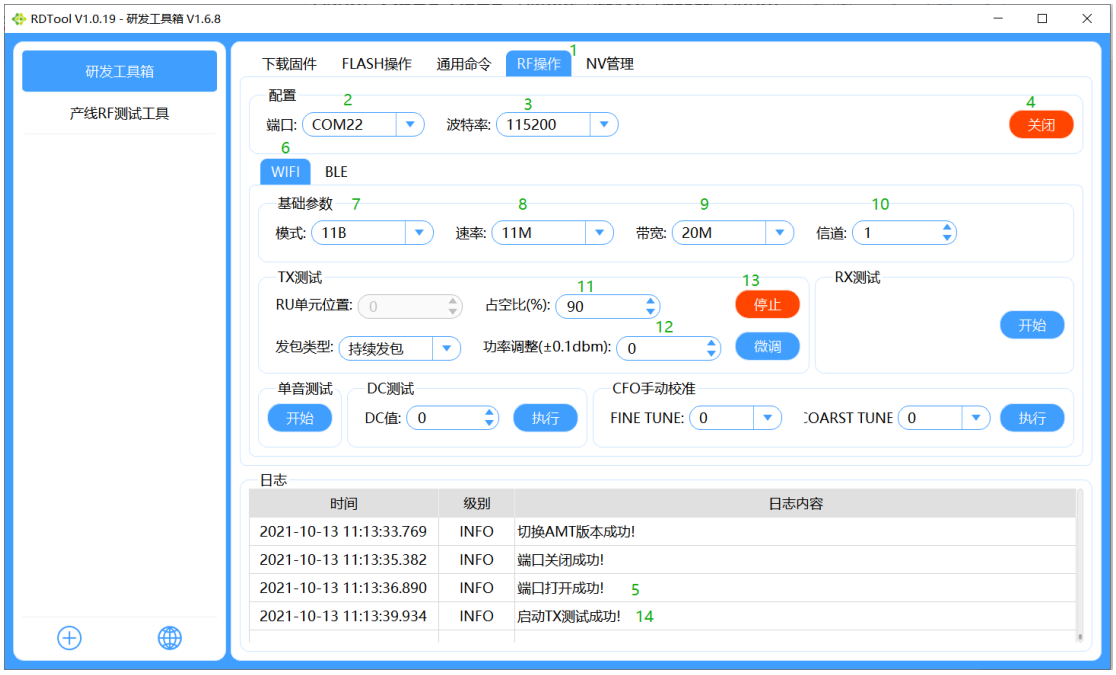
4. RF Test

RF test works in SPI-Flash mode.

4.1 WIFI Test

4.1.1 WIFI TX Test

WIFI TX test is mainly developed for the convenience of RF engineers to manually manipulate the transmit mode of the chip, which means that this function does not include instrument control. The instrument needs to be operated manually to match the transmission parameters of the chip, so that detailed TX parameter data of the chip can be viewed.



Step1: Select the RF Operation interface of the RD Tool;

Step2: Select port number;

Step3: Select boot baud rate, 115200;

Step4: Click “OPEN” to open the COM port;

Step5: If the port is successfully opened, the tool will show that the port is successfully opened;

Step6: Click “WIFI” to enter WIFI test interface;

Step7: Select the WIFI basement parameters, including11B,11G,11N,11AX,11AX_TB;

Step8: Select transmission rate;

Step9: Select transmission channel;

Step10: Select transmission bandwidth, only 11N supports 40M bandwidth;

Step11: Select package duty, default values used 90;

Step12: Select transmission power level; The higher the value of the power level, the greater

the transmission power;

Step13: Click “START” to start WIFI TX test;

Step14: When the TX test is started successfully, the tool will show that the WIFI TX test was started successfully; then observed the WIFI TX parameters on the instrument;

In the process of TX testing, if the frequency offset is found to be large, the RD Tool’s CFO Manual Calibration can manually calibrate the frequency offset to be near 0. The manual calibration in RD tool is only valid for this test and will not be saved during power failure.

4.1.2 WIFI RX Test

The WIFI RX test is mainly developed to facilitate RF engineers to manually manipulate chip receivers, meaning that this feature does not include instrument control. This feature requires manually playing waveform files from the meter, and reporting RX data to the PC side when clicking RX[Stop]. The number of packets received is presented in the log table.

Step1~Step10 is same as the WIFI TX configuration;

Step11: Click “START” to start the WIFI RX test;then have the meter send the waveform of the corresponding mode;

Step12: Click “STOP” to stop the WIFI RX test;

Step13: The correct number of packets received by the chip is displayed in the tool interface;

4.2 BLE Test

RESET

Before testing BLE parameters, the chip need to click “RESET” to reset the BLE module.

4.2.1 BLE TX Test

Step1~Step4 is same as the WIFI TX configuration;

Step5: Click “BLE” to enter WIFI test interface;

Step6: Click “RESET” to reset the BLE module;

Step7: Select the BLE transmission rate, including BLE 1Mbps, BLE 2Mbps;

Step8: Select transmission channel;

Step9: Select transmission power level; The higher the value of the power level, the greater the transmission power;

Step10: Select transmission package type;

Step11: Select payload;

Step12: Click “START” to start the BLE TX test;

Step13: When the TX test is started successfully, the tool will show that the BLE TX test was started successfully; then observed the BLE TX parameters on the instrument;

4.2.2 BLE RX Test

The BLE RX test is mainly developed to facilitate RF engineers to manually manipulate chip receivers, meaning that this feature does not include instrument control. This feature requires manually playing waveform files from the meter, and reporting RX data to the PC side when clicking RX[Stop]. The number of packets received is presented in the log table.

Step1~Step8 is same as the BLE TX configuration;

Step9: Click “START” to start the BLE RX test; then have the meter send the waveform of the corresponding mode;

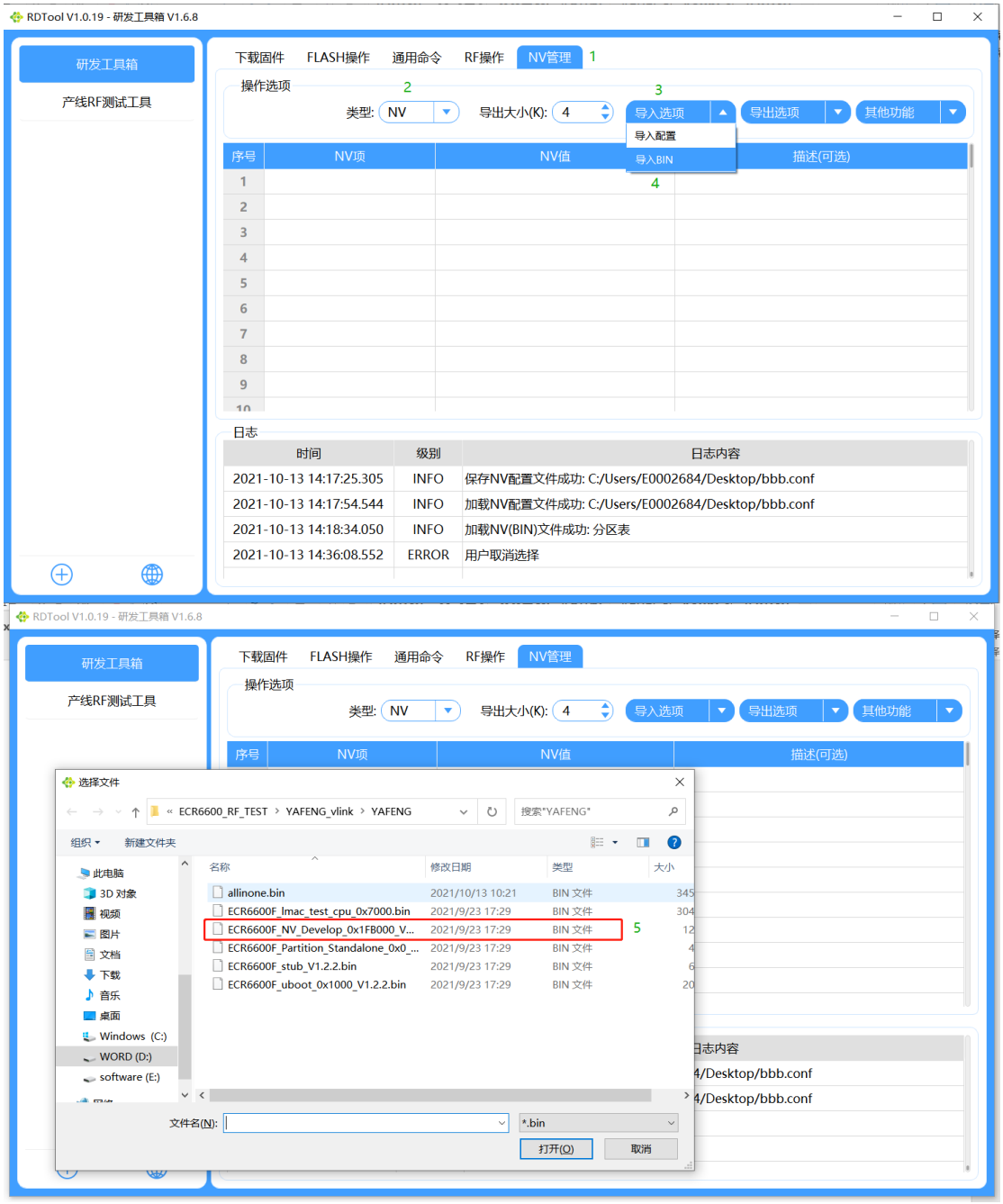
Step10: After stop the BLE RX test, The correct number of packets received by the chip is displayed in the tool interface;

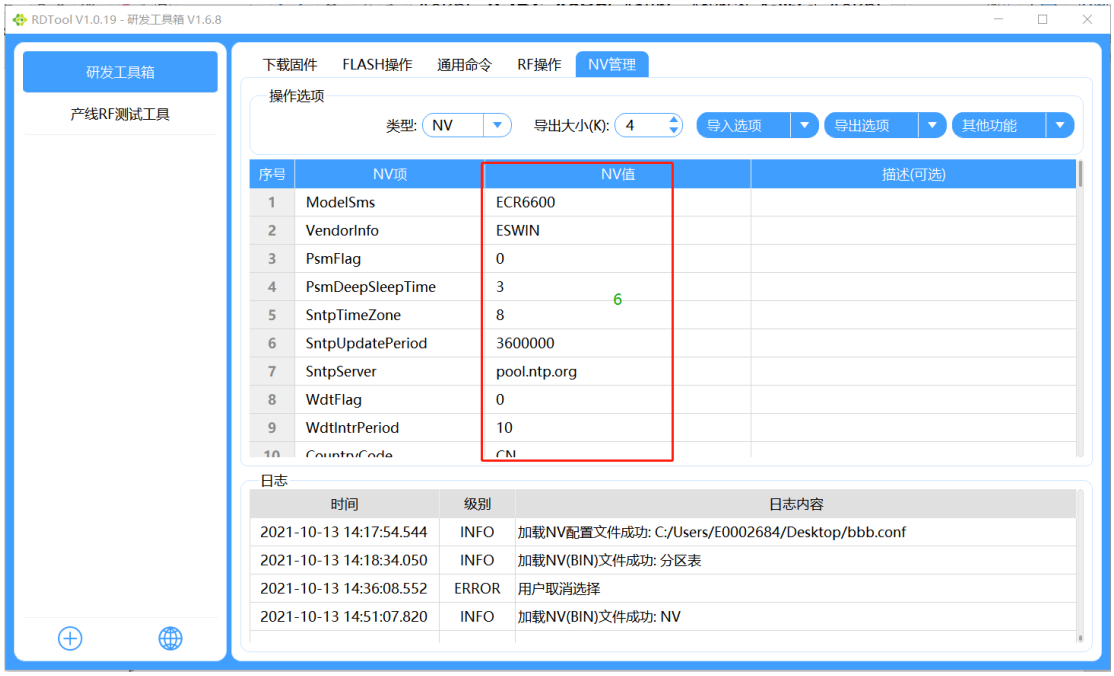
5. NV Management

This function makes it easy to modify parameters in NV.

5.1 Import the bin

Import the bin file whose NV parameters need to be modified. Modify parameters on the RD tool interface and export the bin file whose NV parameters have been modified.

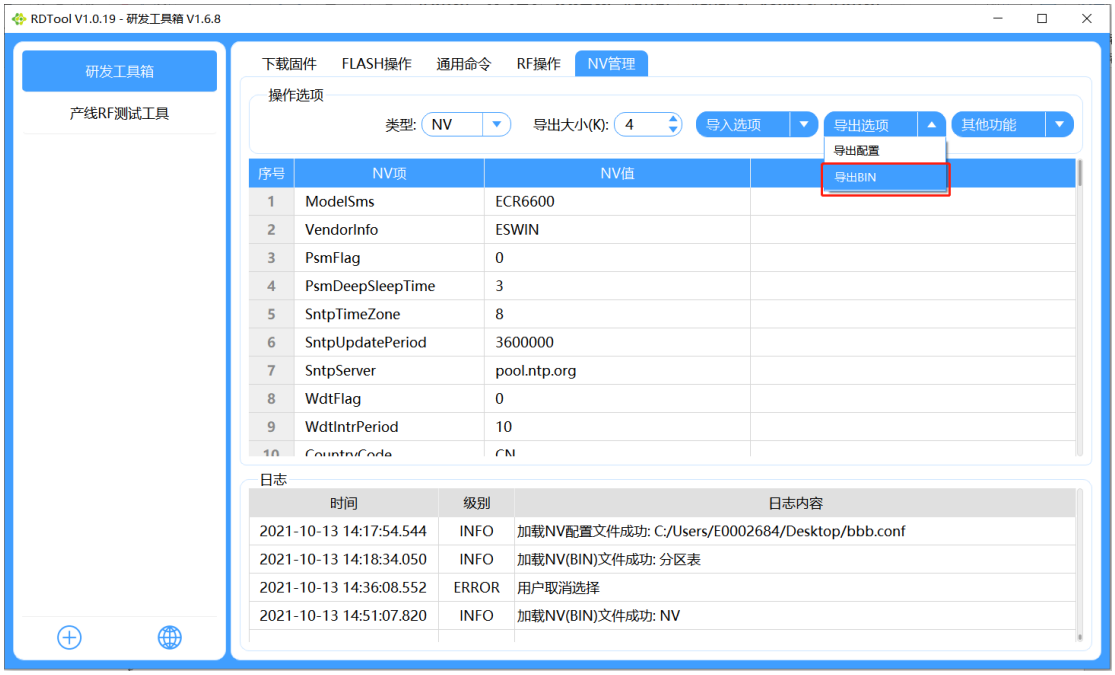


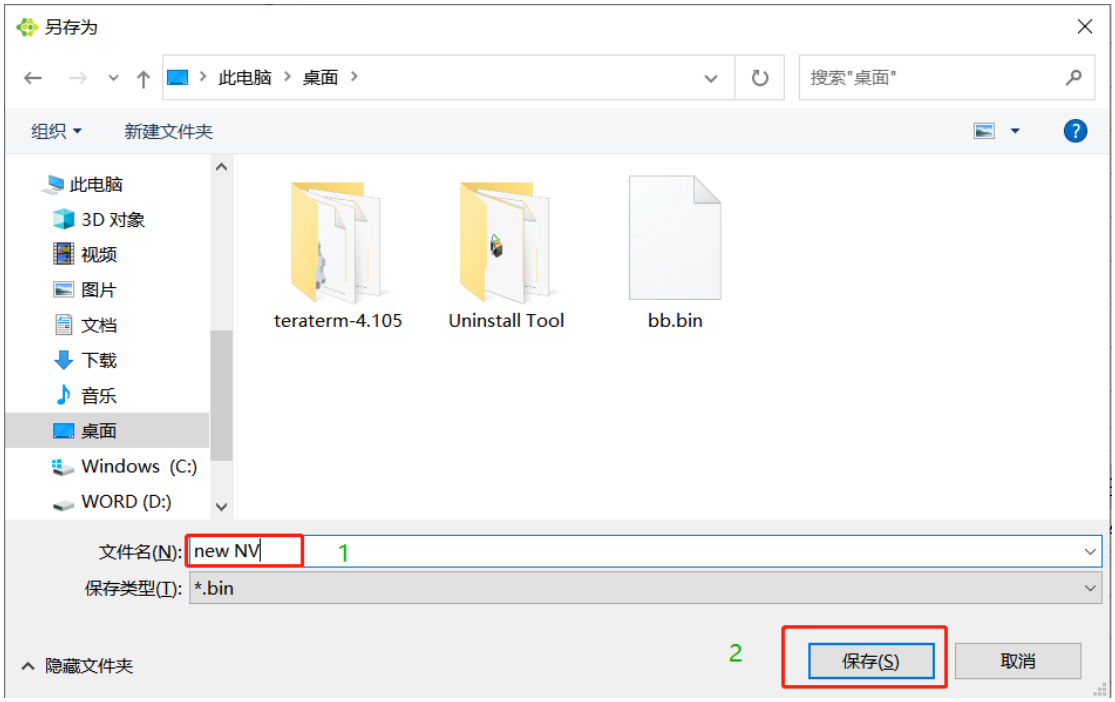


Step1: Click NV Management;
Step2: The selection type is NV;
Step3~4: Select “Import BIN” under import options;
Step5: Select the bin file that you want to modify, Only the bin file containing the NV parameter is valid;
Step6: Modify parameters on the RD Tool interface.

5.2 Export the bin

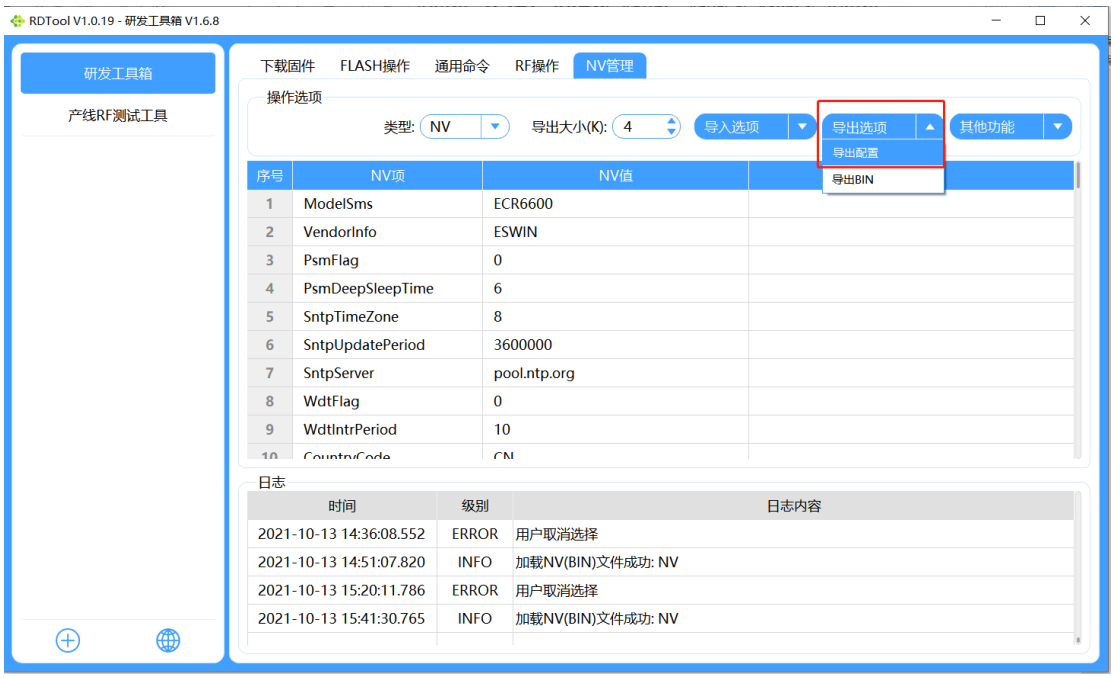
After operations in Part 5.1 are complete, export the bin file.

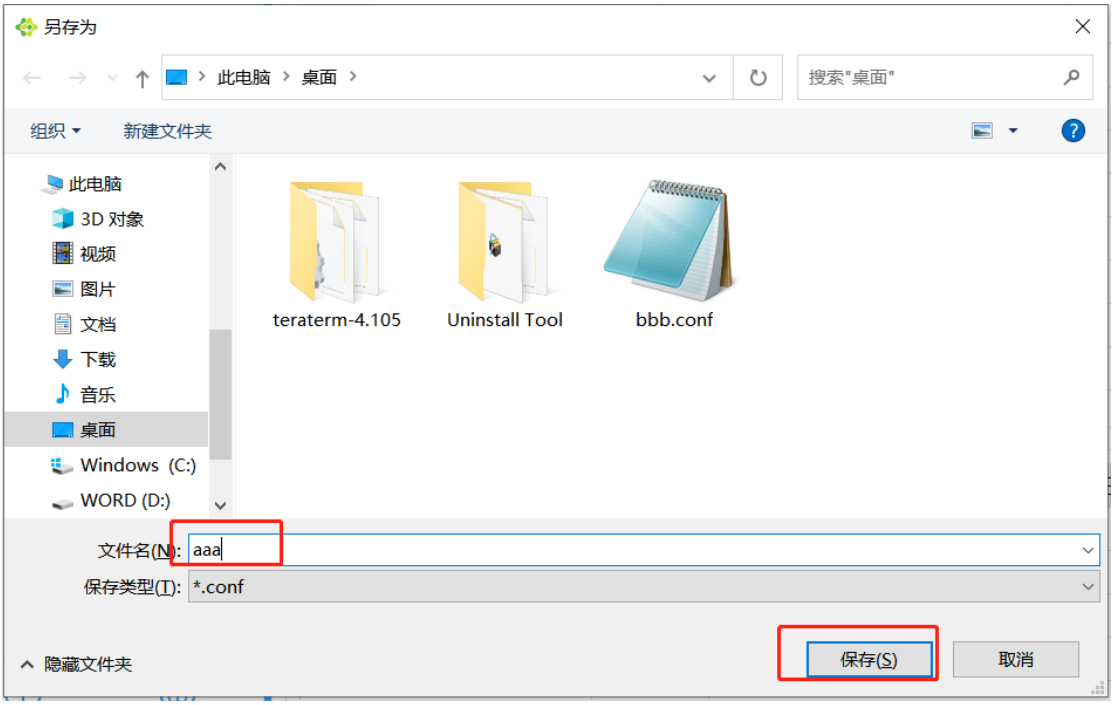




5.3 Export the configuration

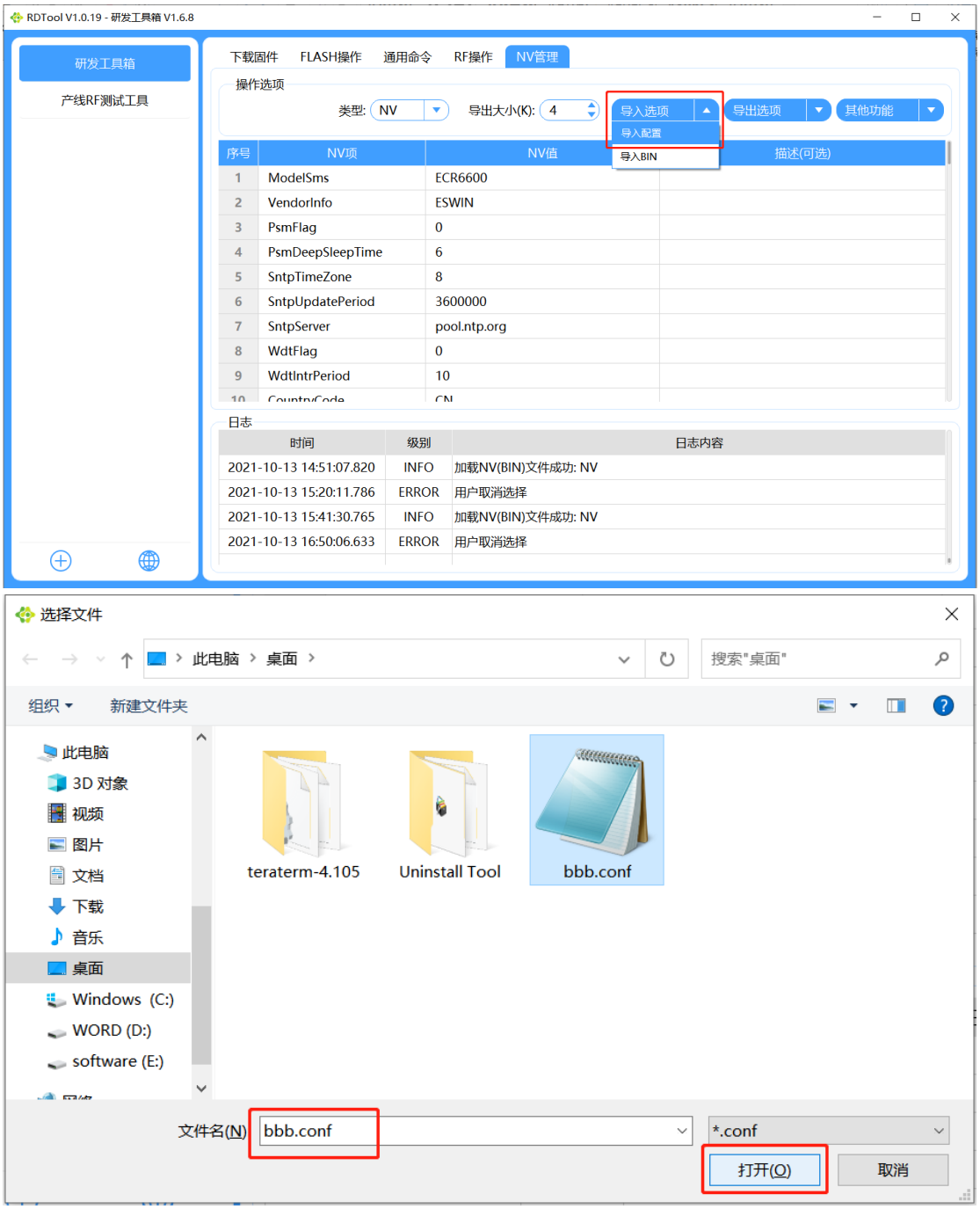
The NV configuration is exported from the bin file. Therefore, import the bin file first. The exported file is in CONF format. Open it with notepad and modify the parameters.





5.4 Import the configuration

Import the configuration modified in Part5.3 into the RD Tool, in order to generate a new bin file.



5.5 Empty the list