GeehyProg
User Manual

APM32Xxxx Series Upper Computer Software

Version: V1.0.3

1 Introduction

This document mainly describes how the upper computer software performs such operations as burning, reading, erasing, and model selection on the APM32Xxxx series chips, and how to read and rewrite the option bytes of each chip.

The upper computer software introduced in this document can perform operation on the chip in three ways, including DFU mode, ISP mode, and PROG mode. Users only need to switch the connection method and replace different connection lines, and do not need to switch between different upper computer software, and it is simple and fast. PROG mode supports online and offline operation of the chip. The upper computer software introduced in this document is available in both Chinese and English, hence convenient for users to use.

The upper computer software introduced in this document will be continuously upgraded and updated as needed, and user requirements are put in the first place.

Contents

2 Software operating environment

(1) Operating systems of Win7 and later versions;

(2) Win7 operating systems require installation of Microsoft .NET Framework 4.6 or later versions.

3 Software installation

(1) Chinese operating system is installed using GeehyProg_SetUp_Chinese.msi;

(2) Operating systems in English or other languages are installed using GeehyProg_SetUp_English.msi.

4 Connection mode

4.1 Supported connection modes

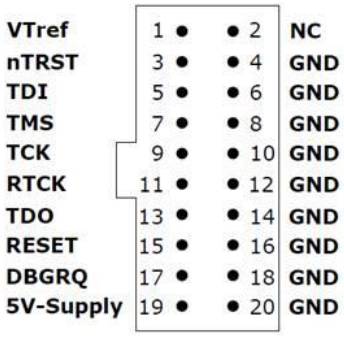
(1) DFU mode: USB connection;

(2) ISP mode: serial port connection;

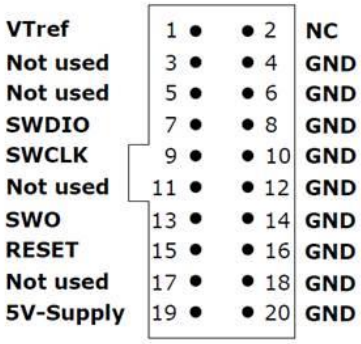
(3) PROG mode: burner connection.

4.2 PROG interface description

ARM JTAG protocol



ARM SWD protocol



Notes:

When burning with SWD or JTAG interface disabled, the RESET pin of the chip must be first connected to the RESET pin of the burner.

5 Supported products

Chip model	DFU mode	ISP mode	PROG mode
APM32A091	/	/	Yes
APM32A103	/	/	Yes
APM32A407	Yes	Yes	Yes
APM32E030	/	Yes	Yes
APM32E103	/	Yes	Yes
APM32F003	/	/	Yes
APM32F030	/	Yes	Yes
APM32F035	/	Yes	Yes
APM32F051	/	Yes	Yes
APM32F072	Yes	Yes	Yes
APM32F091	/	Yes	Yes
APM32F101	/	Yes	Yes
APM32F102	/	Yes	Yes
APM32F103	/	Yes	Yes
APM32F107	Yes	Yes	Yes
APM32F403	Yes	Yes	Yes
APM32F403	Yes	Yes	Yes
APM32F405	/	Yes	Yes
APM32F407	Yes	Yes	Yes
APM32F411	Yes	Yes	Yes
APM32F415	/	Yes	Yes
APM32F417	/	Yes	Yes
APM32H407	Yes	Yes	Yes
APM32M3514	/	Yes	Yes
G32A1445	/	/	Yes
G32A1465	/	/	Yes
G32R501	/	/	Yes

6 Software interface

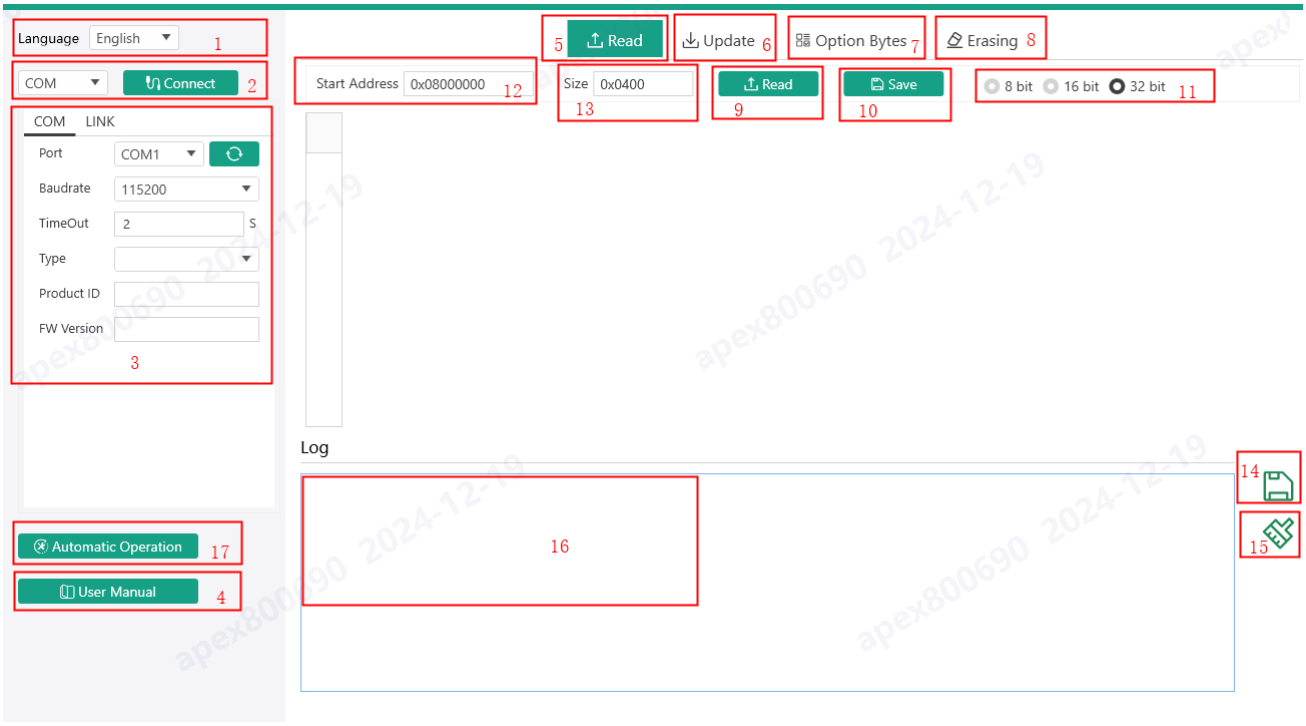


Figure 1 Main Interface

Notes:

1. Switching between Chinese and English;

2. Connection method selection: Serial port connection by default, i.e. ISP mode;

3. Configuration information of serial port connection;

4. Click the button to display the User Manual;

5. Read and display chip data;

6. Update and burn the chip;

7. Update and read the configuration related to option bytes;

8. Erase chip operation;

9. Read chip data;

10. Save the read chip data;

11. Display the read chip data in 32bit, 16bit, or 8bit format;

12. Read the start address of chip data;

13. Read the length of chip data;
14. Save operation record information;
15. Clear operation record information;
16. Display area for operation record information;
17. Click the button to switch to automatic operation mode.

7 Connect device

7.1 ISP mode

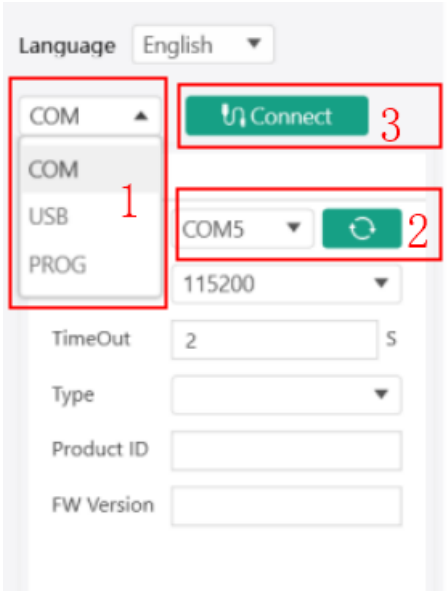


Figure 2 Select Connection Mode

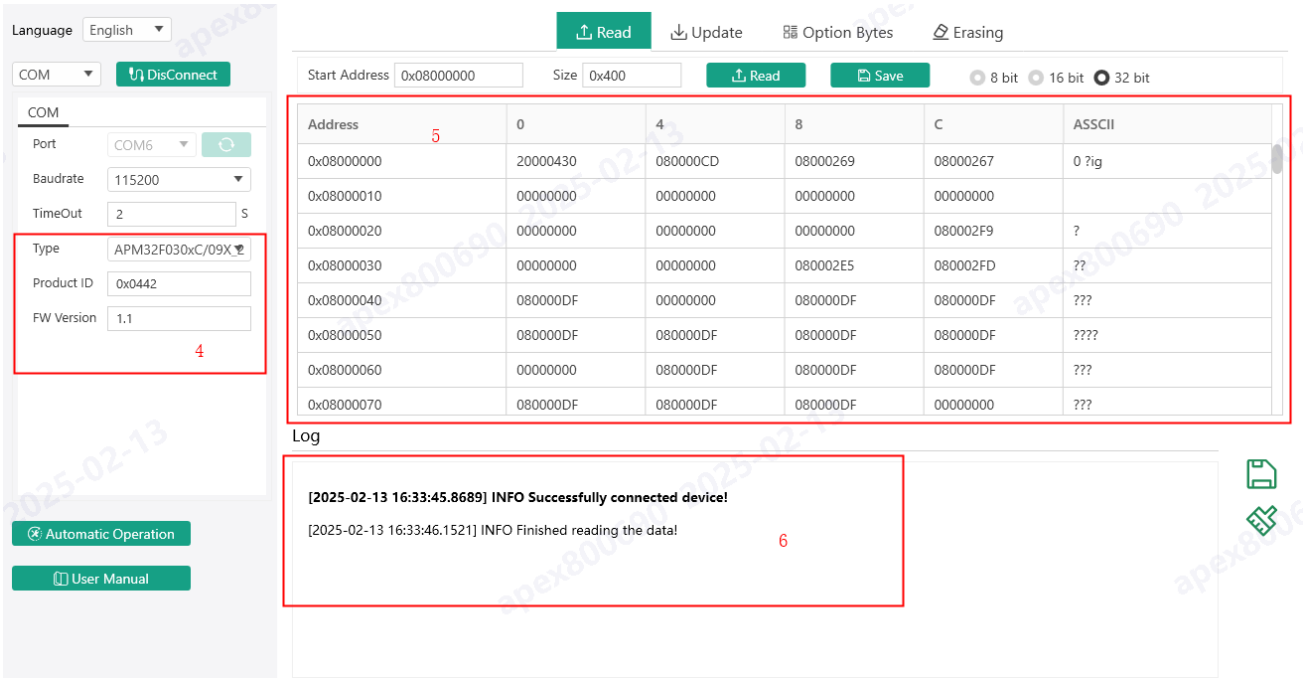


Figure 3 ISP Mode Connection

Notes:

1. Select the connection mode and select COM for ISP mode;

2. Click Refresh button to find the currently connected serial port;

3. Click "Connect device" button to connect the selected serial port number;

4. Display the connected chip model, ID, and firmware version number;

5. Display the read data, the start address is 0x08000000, the data length is 0x0400, and the data is displayed in 32bit format;

6. The operation record shows that the device is already connected.

7.2 DFU mode

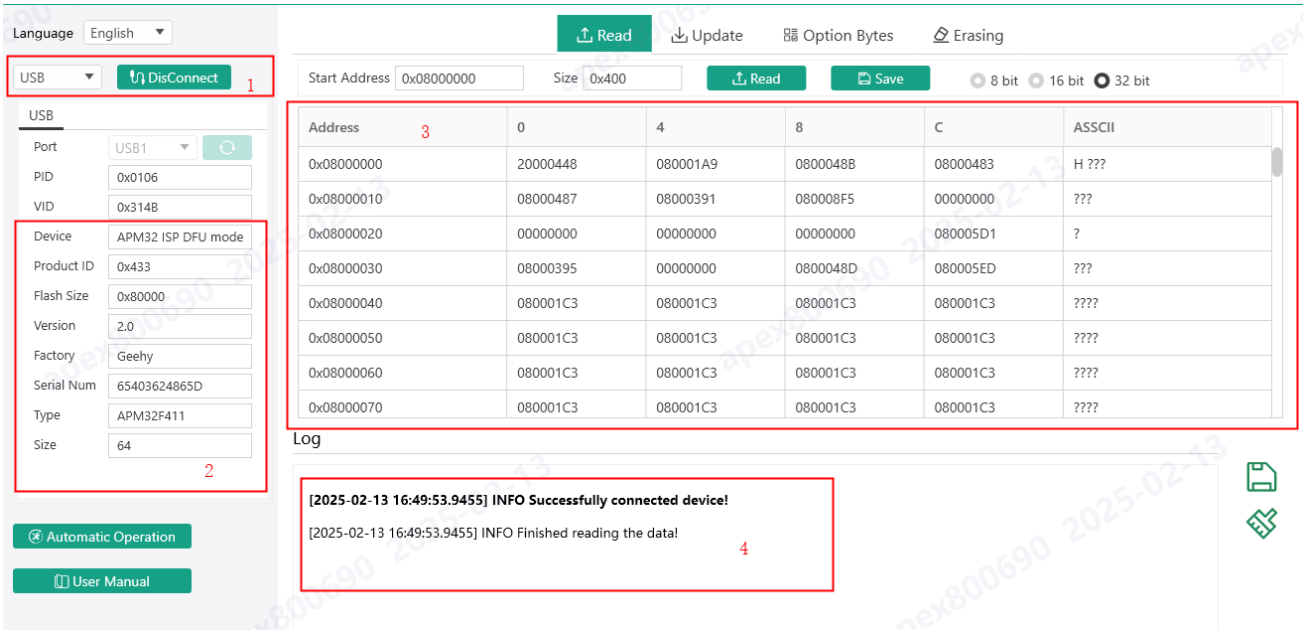


Figure 4 DFU Mode Connection

Notes:

1. Select USB for DFU mode, click Refresh button to find the currently connected USB, and click "Connect device" button to connect the selected USB;

2. Display the information of connected chip such as model, ID, and Flash;

3. Display the data read, the start address is 0x08000000, the data length is 0x0400, and the data is displayed in 32bit format;

4. The operation record shows that the device is already connected.

7.3 PROG mode

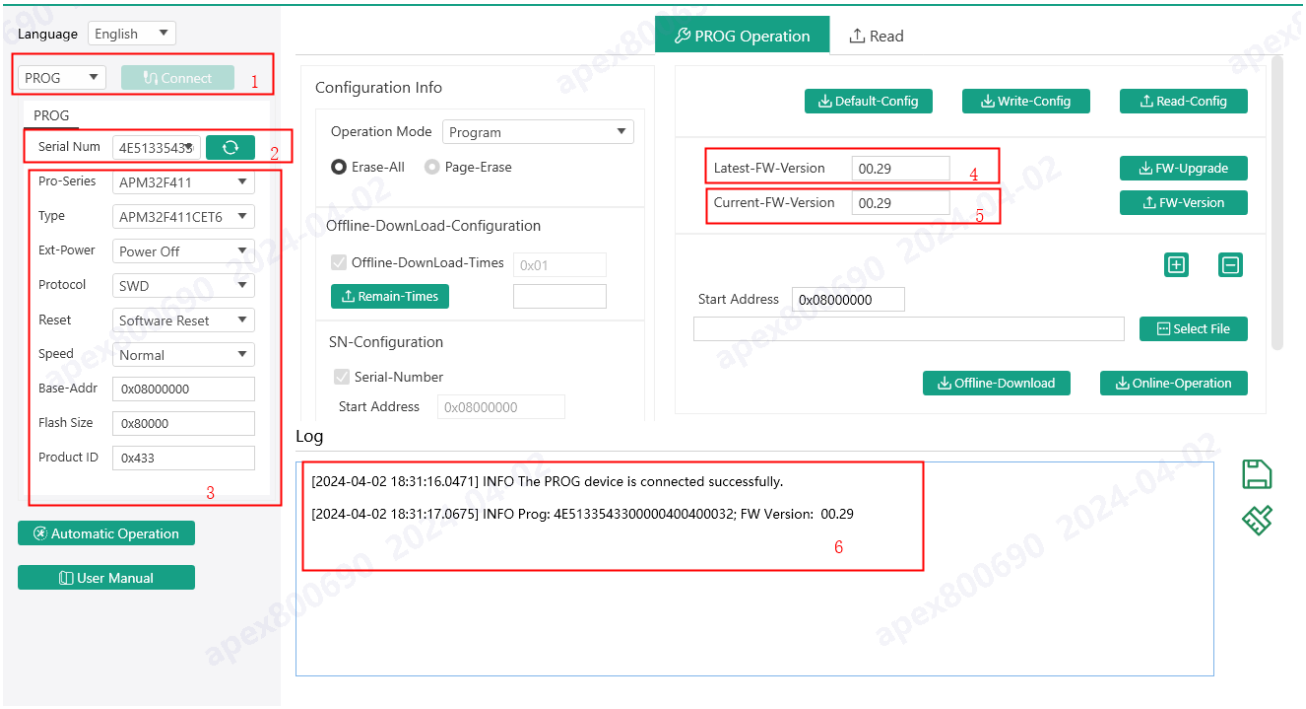


Figure 5 PROG Mode Connection

Notes:

1. Select PROG; this mode does not require clicking "Connect device" and supports automatic device identification;

2. Click Refresh button to find the currently connected burner;

3. Switch chip model to display relevant chip information;

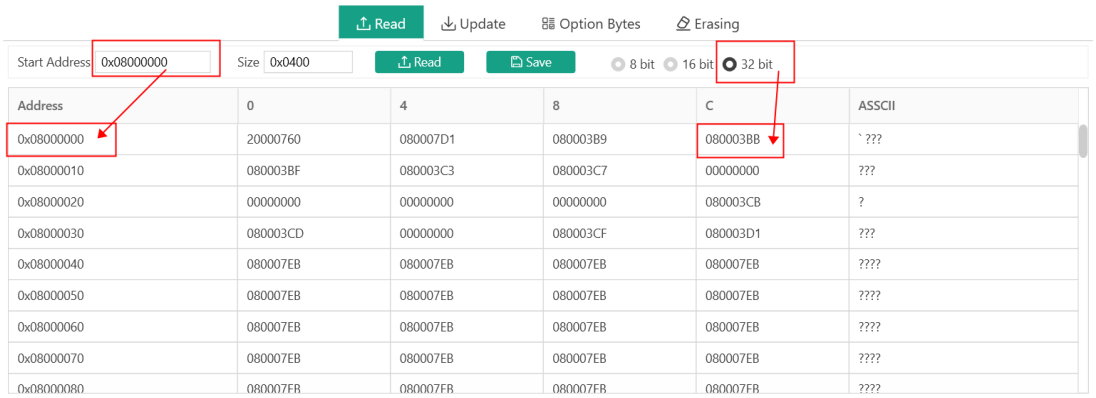
4. Display the latest firmware version of the burner;

5. Display the firmware version of currently connected burner;

6. Display the information about burner connection.

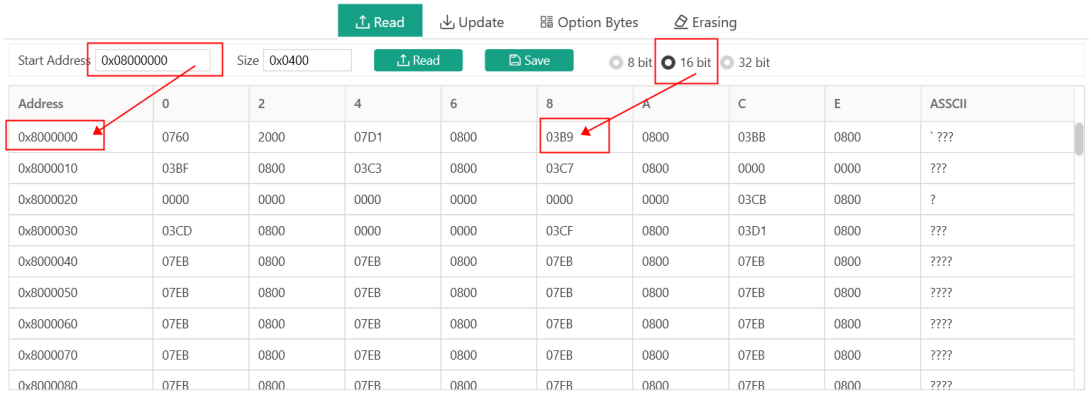
8 Read

8.1 Read data



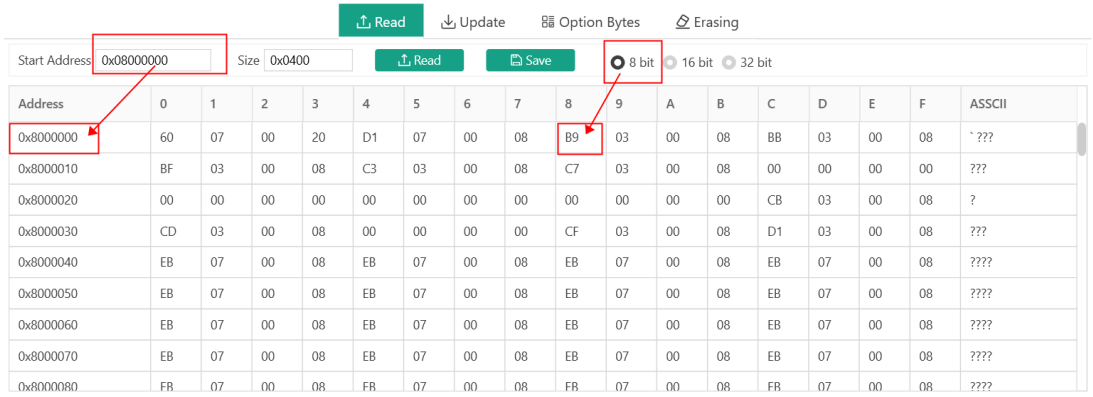
Address	0	4	8	C	ASSCII
0x08000000	20000760	080007D1	080003B9	080003BB	` ???
0x08000010	080003BF	080003C3	080003C7	00000000	???
0x08000020	00000000	00000000	00000000	080003CB	?
0x08000030	080003CD	00000000	080003CF	080003D1	???
0x08000040	080007EB	080007EB	080007EB	080007EB	????
0x08000050	080007EB	080007EB	080007EB	080007EB	????
0x08000060	080007EB	080007EB	080007EB	080007EB	????
0x08000070	080007EB	080007EB	080007EB	080007EB	????
0x08000080	080007EB	080007EB	080007EB	080007EB	????

Figure 6 32bit Display Data



Address	0	2	4	6	8	A	C	E	ASSCII
0x8000000	0760	2000	07D1	0800	03B9	0800	03BB	0800	` ???
0x8000010	03BF	0800	03C3	0800	03C7	0800	0000	0000	???
0x8000020	0000	0000	0000	0000	0000	0000	03CB	0800	?
0x8000030	03CD	0800	0000	0000	03CF	0800	03D1	0800	???
0x8000040	07EB	0800	07EB	0800	07EB	0800	07EB	0800	????
0x8000050	07EB	0800	07EB	0800	07EB	0800	07EB	0800	????
0x8000060	07EB	0800	07EB	0800	07EB	0800	07EB	0800	????
0x8000070	07EB	0800	07EB	0800	07EB	0800	07EB	0800	????
0x8000080	07EB	0800	07EB	0800	07EB	0800	07EB	0800	????

Figure 7 16bit Display Data



Address	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	ASSCII
0x8000000	60	07	00	20	D1	07	00	08	B9	03	00	08	BB	03	00	08	` ???
0x8000010	BF	03	00	08	C3	03	00	08	C7	03	00	08	00	00	00	00	???
0x8000020	00	00	00	00	00	00	00	00	00	00	00	00	CB	03	00	08	?
0x8000030	CD	03	00	08	00	00	00	00	CF	03	00	08	D1	03	00	08	???
0x8000040	EB	07	00	08	EB	07	00	08	EB	07	00	08	EB	07	00	08	????
0x8000050	EB	07	00	08	EB	07	00	08	EB	07	00	08	EB	07	00	08	????
0x8000060	EB	07	00	08	EB	07	00	08	EB	07	00	08	EB	07	00	08	????
0x8000070	EB	07	00	08	EB	07	00	08	EB	07	00	08	EB	07	00	08	????
0x8000080	EB	07	00	08	EB	07	00	08	EB	07	00	08	EB	07	00	08	????

Figure 8 8bit Display Data

8.2 Save data

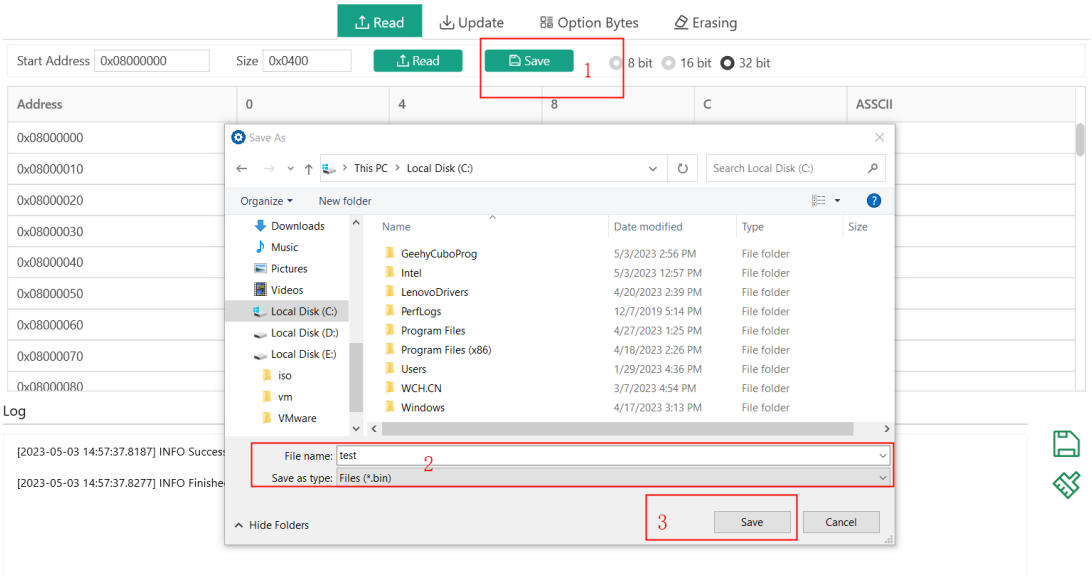


Figure 9 Save File

Notes:

1. Click "Save";

2. Select the name and path to save the file;

3. Click "Save".

9 Update

9.1 .bin, .hex and .s19 updates

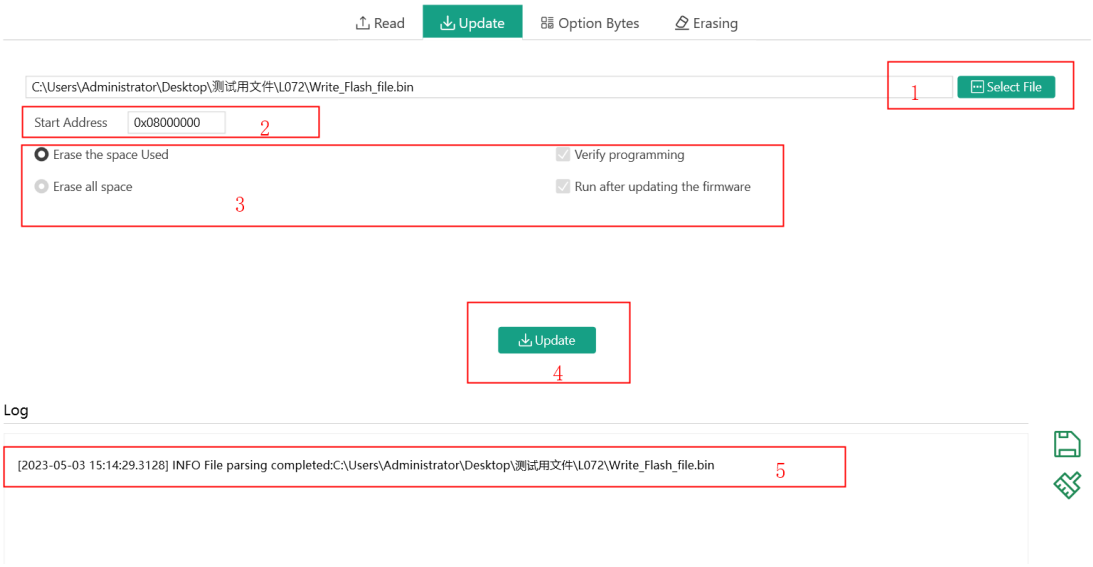


Figure 10 Update File

Notes:

1. Select the files to be updated, which can be in the format of . bin, . hex, . s19, and. dfu; .dfu can only be selected in DFU mode;

2. The start address can be entered only by selecting .bin file;

3. Check as required;

4. Click "Update" to start execution;

5. Display the operation results.

9.2 .dfu file update

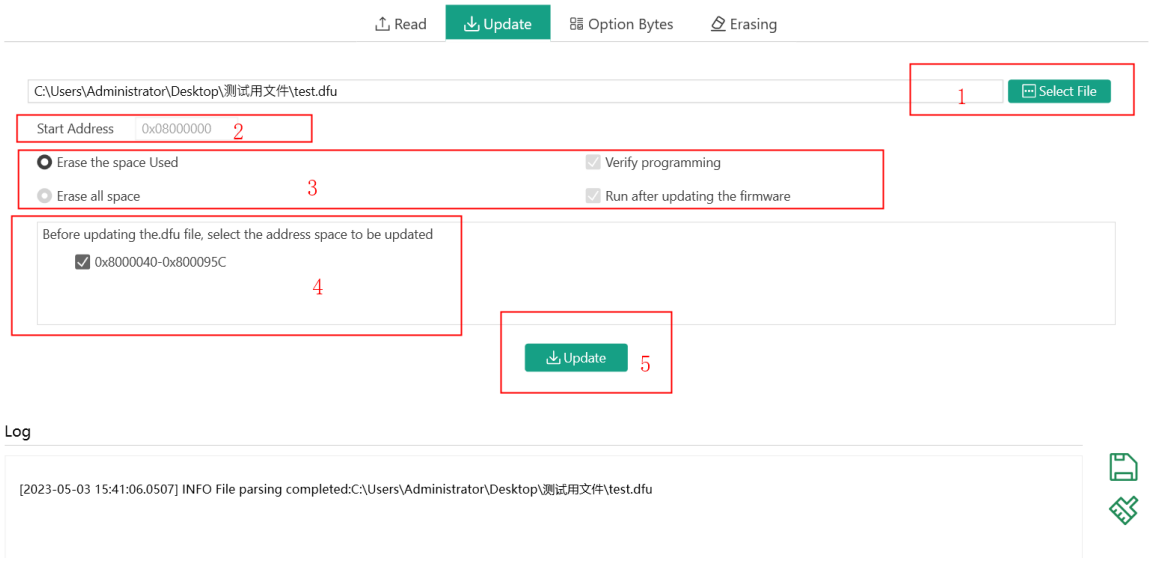


Figure 11 Update .dfu File

Notes:

1. Select the .dfu files to be updated, which can be selected only in DFU mode;

2. Select .dfu file. The start address cannot be entered;

3. Check as required;

4. Select the address to be updated;

5. Click "Update" to start execution.

10 Option byte

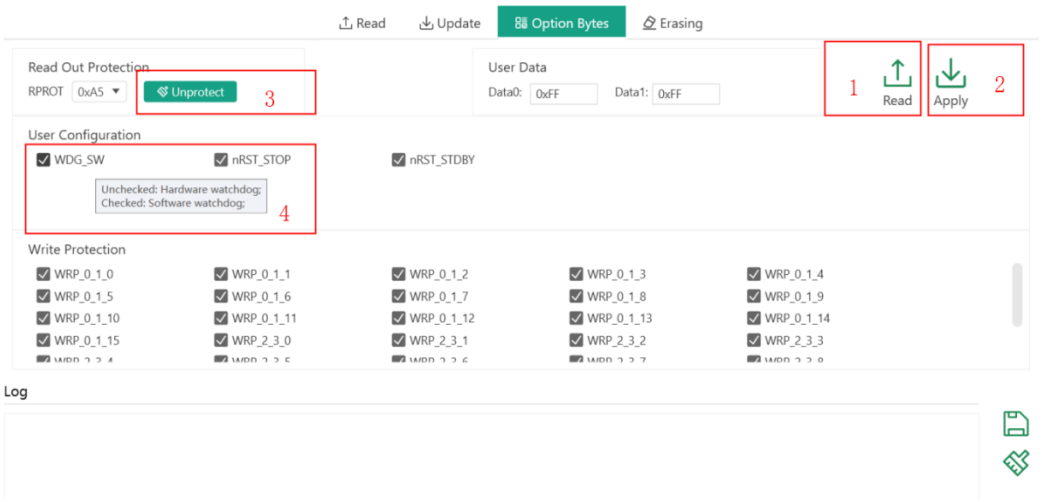


Figure 12 Option Byte Interface

Notes:

1. After the device is connected, click "Read" option byte data and display the content of the option byte on the interface;

2. Check, uncheck, or enter on the interface, and click "Apply" to modify the chip option byte data;

3. Click "Cancel read protection" to modify the chip read protection;

4. When the mouse hovers over a certain configuration item, there will be a prompt message for this configuration item.

11 Erase

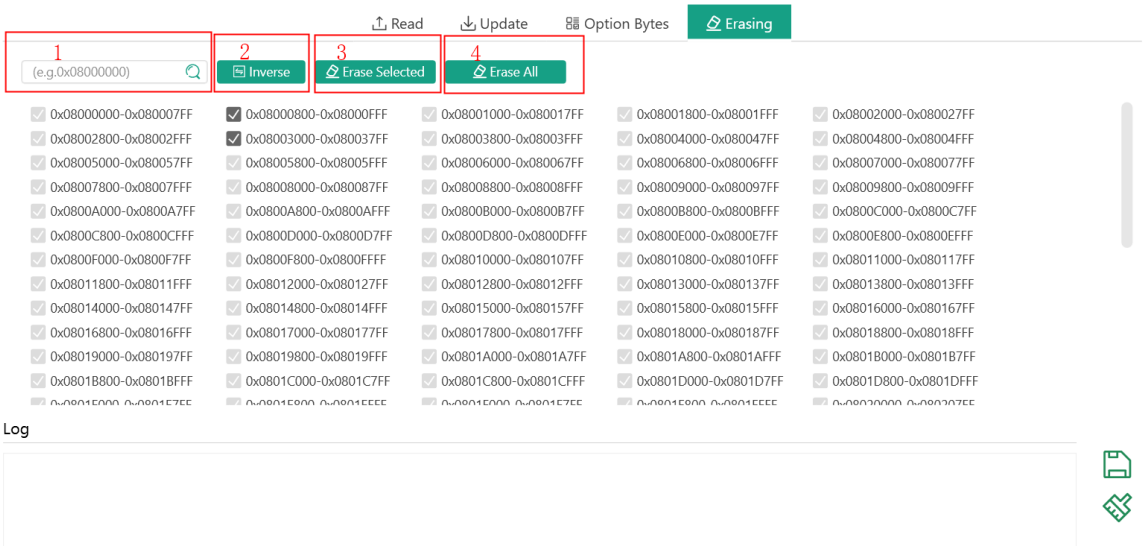


Figure 13 Erase Interface

Notes:

1. Enter the address needing to be erased for search, and once it is found, this address will be in the selected state;

2. Click “Invert selection” and the selected and unselected addresses will be put in the opposite state;

3. Click “Erase selected” to erase the selected address;

4. Click 'Erase all' to erase all chips.

12 PROG operation

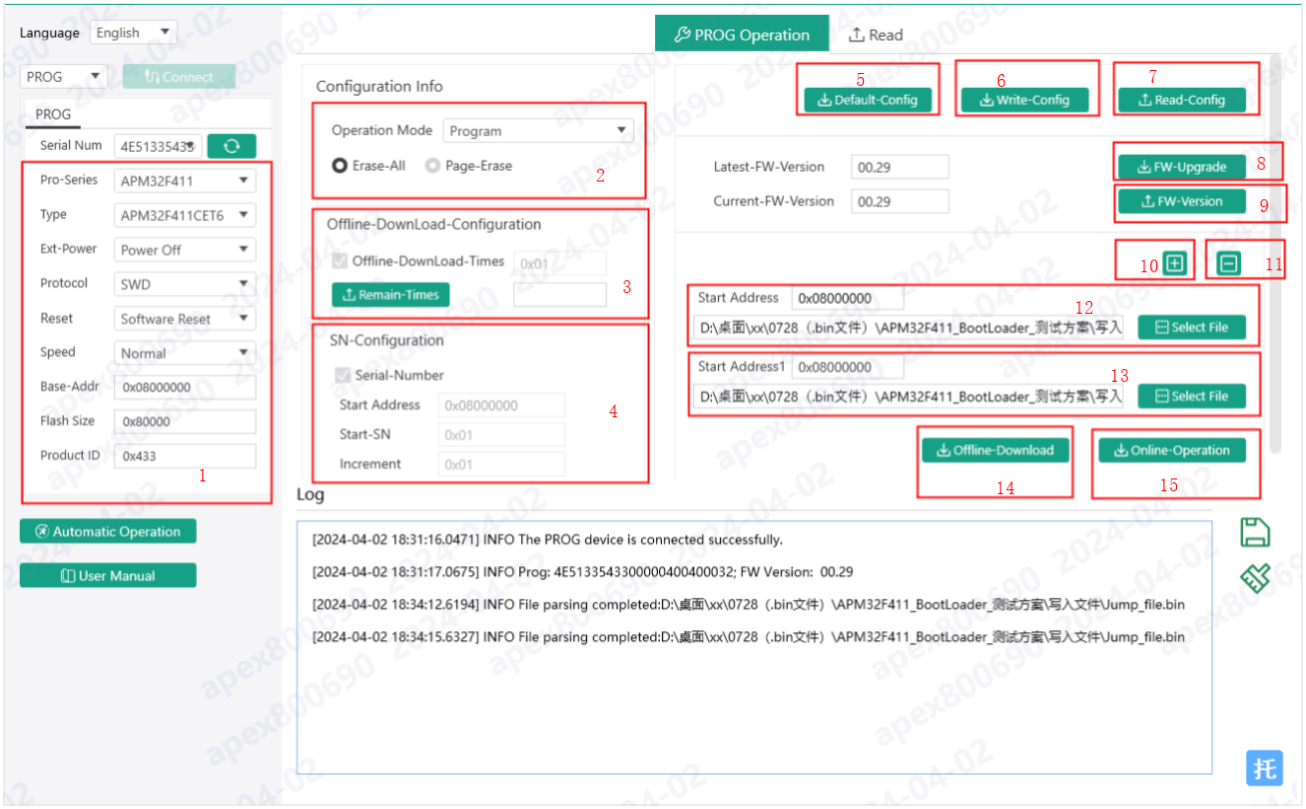


Figure 14 PROG Operation Interface

Notes:

1. Chip model selection, burner configuration selection, Flash start address, Flash size, ID, and other information;

2. Burning method, and erasing method;

3. Setting of the number of offline burning times and query of the number of remaining offline burning times;

4. Setting of information such as serial number writing address;

5. Click “Restore default configuration” and the default configuration information will be displayed on the interface;

6. Click "Write configuration information" and the configuration information set on the interface will be written to the burner;

7. Click "Read configuration information" to read the configuration information of the burner and display it on the interface;

8. Click "Firmware upgrade" to upgrade the firmware of the burner;

9. Click “Firmware version” to read the firmware version of the burner.

10. Increase the number of files to be burned, up to 5 files can be selected;

11. Reduce the number of files to be burned;

12. Example, the first file to be burned and the start address;

13. Example, the second file to be burned and the start address;

14. Click "Offline download" to write the “.bin” or “.hex”, “.s19” files selected by “Select file” button to the burner;

15. Click "Online operation" and operate the chip online according to the operation method selected in "Configuration information" and the ".bin" or ".hex" or ".s19" files selected by "Select file" button.

13 Automatic Operation

1. In this mode, according to the connected device type and the selected operation options, the automatic cycle of erasure, file download update, option byte update operations;

2. At the end of each current operation, the software will prompt the user to replace the device;

3. When the software detects that the device is connected, it will automatically perform the operations in item 1 until the user "Stop" or "Exit-Automatic";

4. If the two connected devices are the same device, the last connected device will not perform the operation in item 1, and the software will continue to wait for the detection device connection;

5. If the type of the connected device is different from that detected when the device enters the automatic operation mode, the connected device will not perform the operation in item 1, and the software will continue to wait for the detection device connection.

13.1 Automatic Operation in ISP or DFU Mode

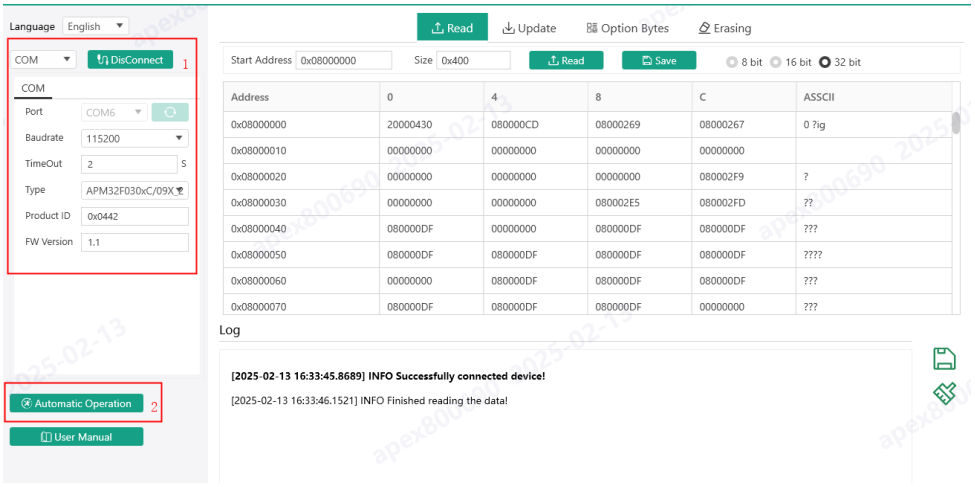


Figure 15 Connecting device

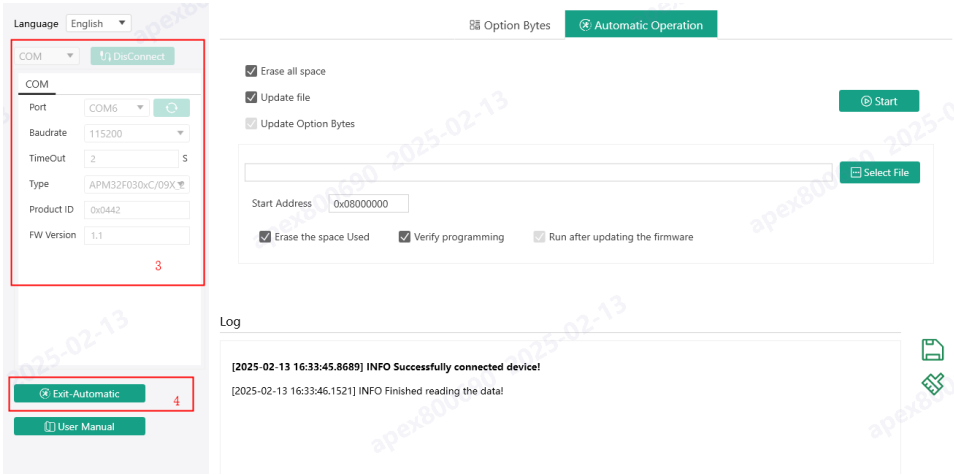


Figure 16 Enter automatic operation mode

Notes:

(The ISP is used as an example to enter the automatic operation mode, and the DFU mode is the same.)

1. Only one device can be connected at a time, otherwise when entering the automatic mode, the software will prompt you to connect multiple devices at the same time, and will not perform automatic operations. That is, only one serial port can be connected to the device in ISP mode, only one USB cable can be connected to the device in DFU mode, and only one burner can be connected to the device in PROG mode;

2. Click "Automatic operation" to switch to automatic operation mode;

3. One and only one device is successfully connected, and device related information is displayed;

4. Click "Exit-Automatic", return to the previous operation interface.

13.2 Automatic Operation in PROG Mode

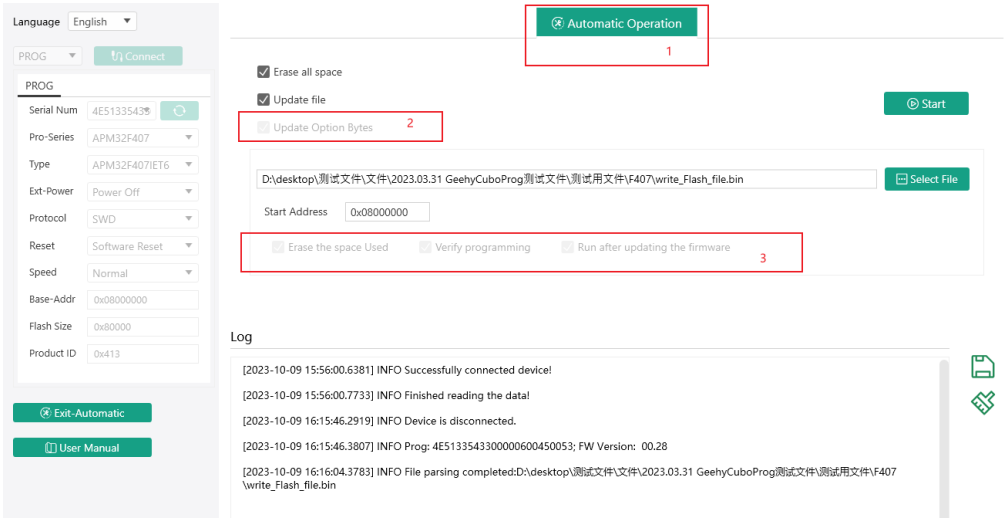


Figure 17 Enter automatic operation mode

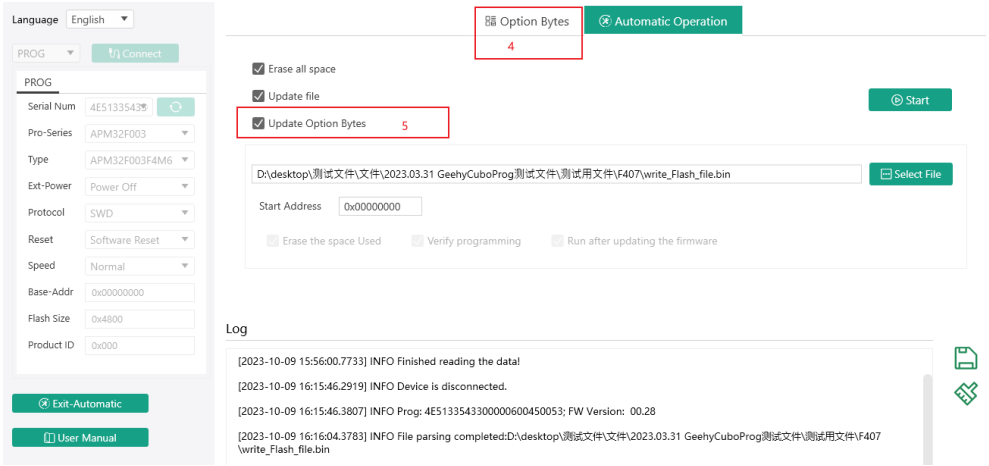


Figure 18 Enter automatic operation mode

Notes:

1. Enter the automatic operation mode in PROG mode to display the interface; The configuration information will use the information already configured when switching to automatic operation mode;

2. "Update Option Bytes", available only when model APM32F003/ APM32S003 is selected;

3. The configuration information will use the information that has been configured when switching to the automatic operation mode, and the check box here is not optional;

4. When the model APM32F003/ APM32S003 is selected, the "Option Bytes" interface is displayed.

5. Select "Update Option Bytes" to switch to the option byte interface, you can modify the option byte as required.

13.3 Operating interface

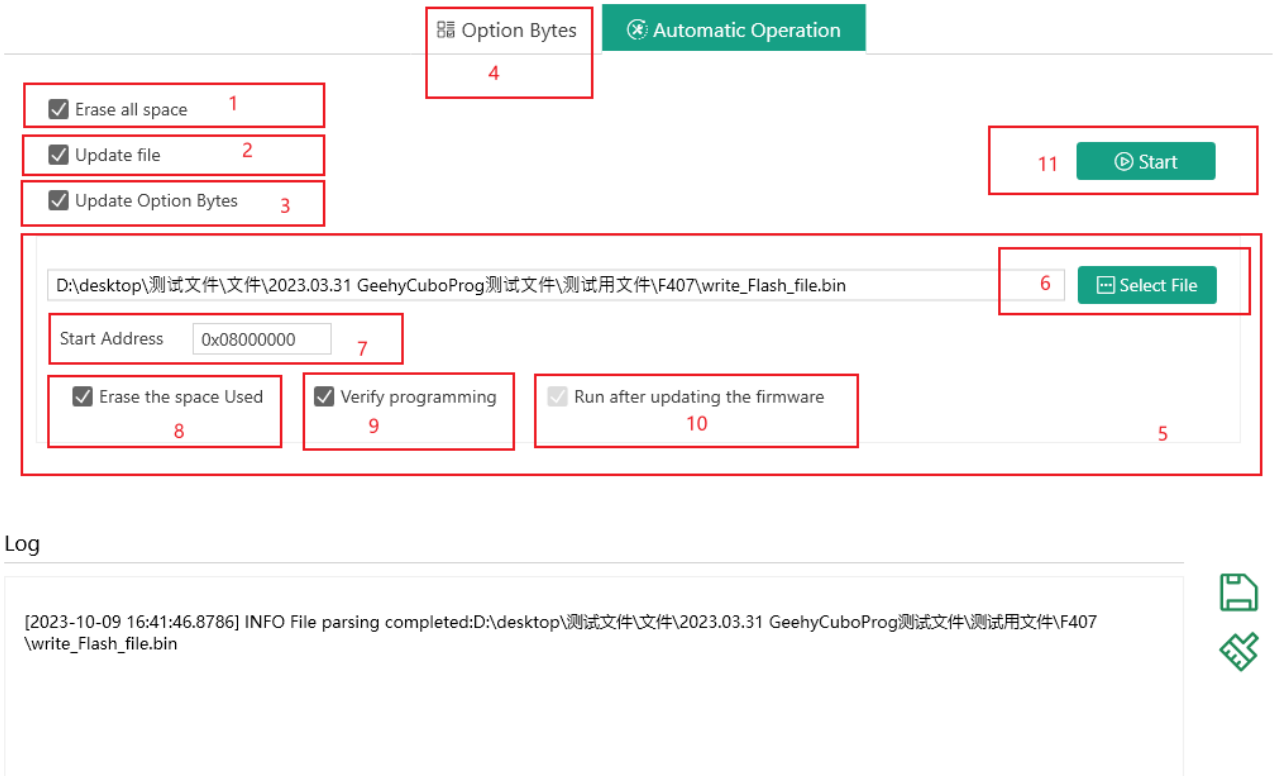


Figure 19 Automatic operation mode interface

Notes:

1. Select "Erase all space", then perform the erase operation after "Start";

2. Select "Update file", you can operate the options in item 5;

3. If you select "Update Option bytes", it will automatically jump to the corresponding option byte interface

in item 4, and you can configure the option byte;

4. Click to switch to the option byte interface;

5. "Update file" option;

6. Click "Select File" to select the file to be downloaded and updated. The file formats you can select include .bin, .hex, .s19;

7. You can enter the start address for downloading updates only when you select the .bin file.

8. Select "Erase the space Used", then perform the erase operation after "Start";

9. If this option is selected, verify the data after the data download and update is completed;

10. Select "Run after updating the firmware", then run the program after the data download and update is completed;

11. Click "Start", start the automatic operation, in the order of item 1, 2, 3 to perform the cycle.

13.4 Operating process

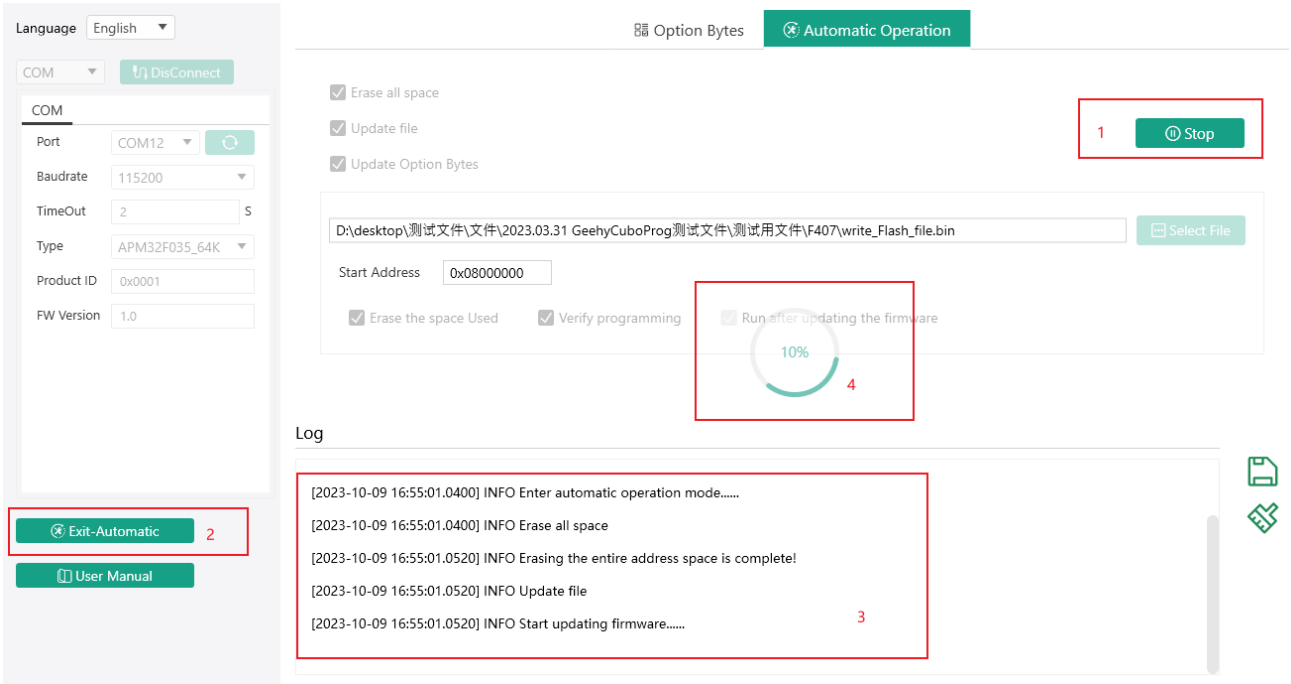


Figure 20 Automatic operation mode interface

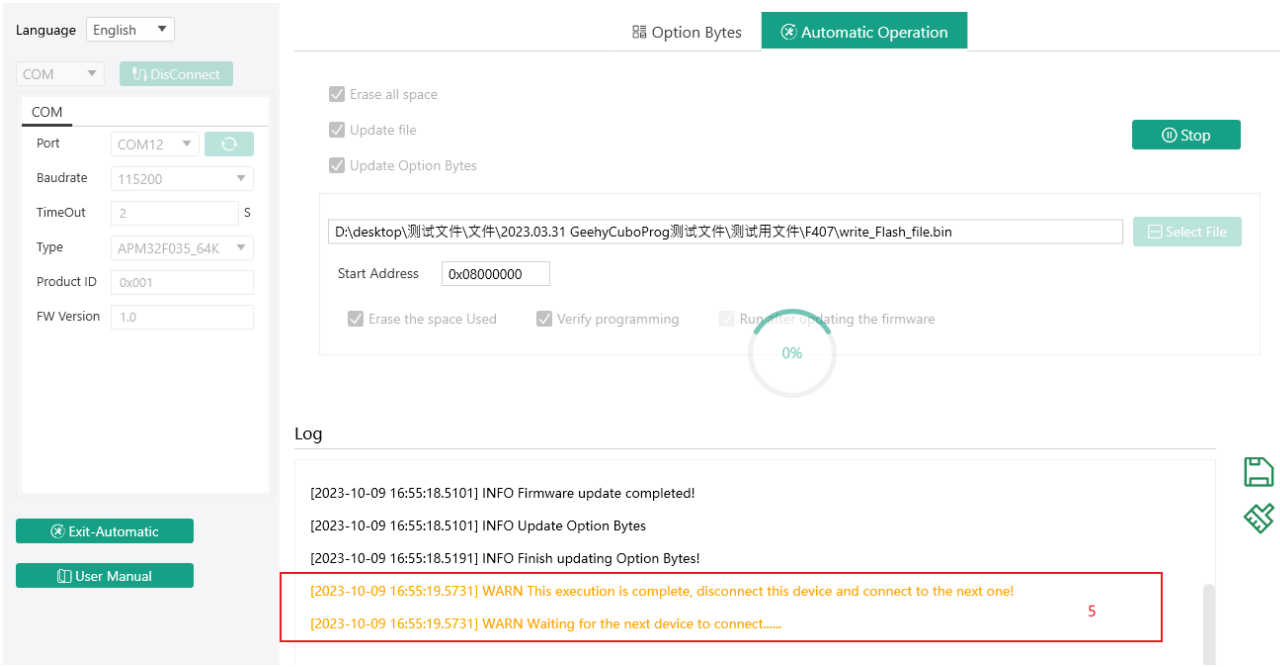


Figure 21 Automatic operation mode interface

Notes:

1. Click "Stop" to stop the detection device after the completion of this operation;

2. Click "Exit-Automatic", that is, after the completion of this operation to stop the detection device, and switch to the previous operation interface;

3. Operation process record;

4. Operation progress display;

5. After the previous operation is completed, wait for the test device.

14 Upgrades

14.1 Client update

Every time the client program is opened, the client automatically checks if there is a new version of the client that needs to be updated. If there is, the client will display the following prompt:

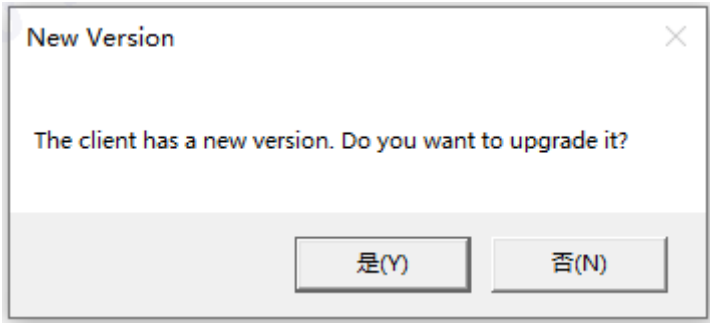


Figure 22 Client update prompt

Notes:

1. Click "Yes": The client automatically downloads the corresponding latest version from the server and opens the latest version of the client after completion.

2. Click "No": The client does not update and remains at the current version.

Tip: The automatic update function of the client requires the computer to be connected to the internet.

14.2 Firmware upgrade

Every time the client program is opened and the programming tool is inserted, the client will check if there is a new version of the firmware that needs to be updated. If there is, the client will display the following prompt:

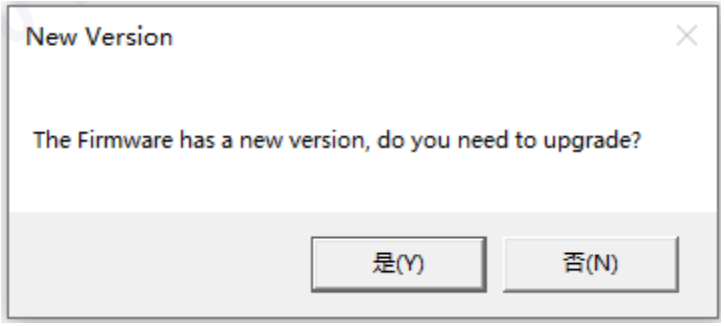


Figure 23 Firmware upgrage prompt

Notes:

1. Click "Yes": The client will upgrade the firmware version of the programmer to the latest firmware

version.

2. Click 'No': The firmware will not be upgraded and will remain at the current firmware version.

15 Version history

Date	Version	Revision History
May 4, 2023	1.0.0	New edition
September 26, 2023	1.0.1	(1) Added support for APM32F035 series and APM32F411 series chips; (2) In PROG operation mode, the function of subsection burning different data files is added; (3) Added features related to automatic operation mode, Chapter 13.
April 12, 2024	1.0.2	(1) Added support for G32A1465 series chips and APM32M3514 series chips; (2)Firmware version V0.29; (3) In PROG operation mode: 1.The start of the configuration information area is deleted on the Prog operation interface Address; 2. Cancel the address of the read data with the write file; (4) Resolved parsing time that was too long when parsing large hex files; (5)The binding between ISP and DFU when reading data and the address of the loss file is removed.; (6)Solve the problem of inconsistent grid height caused by carriage return and line feed in the ASSCI code of the reading interface. (7)Solve the problem that after each read, the saving progress has been 100%, and the data will be stuck; (8)Optimized prog mode: When the connected chip id is different from the selected chip ID, the read interface will be cleared.
February 7,2025	1.0.3	(1)Added support for APM32E030 series，APM32F402 series，APM32F403 series chips and G32R501 series chips; (2)Firmware version V0.30; (3)In PROG operation mode, due to the characteristics of the G32R501 series chips, a new DCS KEY page has been added. When performing offline downloads or online operations, a window will pop up to confirm the configuration of the DCS KEY; (4) Fix the issue where the hex file parses successfully in version V1.0.1 but fails to parse in version V1.0.2. (5) Added new client-side automatic update functionality.

Statement

This document is formulated and published by Geehy Semiconductor Co., Ltd. (hereinafter referred to as “Geehy”). The contents in this document are protected by laws and regulations of trademark, copyright and software copyright. Geehy reserves the right to make corrections and modifications to this document at any time. Please read this document carefully before using Geehy products. Once you use the Geehy product, it means that you (hereinafter referred to as the “users”) have known and accepted all the contents of this document. Users shall use the Geehy product in accordance with relevant laws and regulations and the requirements of this document.

1. Ownership

This document can only be used in connection with the corresponding chip products or software products provided by Geehy. Without the prior permission of Geehy, no unit or individual may copy, transcribe, modify, edit or disseminate all or part of the contents of this document for any reason or in any form.

The “极海” or “Geehy” words or graphics with “®” or “™” in this document are trademarks of Geehy. Other product or service names displayed on Geehy products are the property of their respective owners.

2. No Intellectual Property License

Geehy owns all rights, ownership and intellectual property rights involved in this document.

Geehy shall not be deemed to grant the license or right of any intellectual property to users explicitly or implicitly due to the sale or distribution of Geehy products or this document.

If any third party’s products, services or intellectual property are involved in this document, it shall not be deemed that Geehy authorizes users to use the aforesaid third party’s products, services or intellectual property, unless otherwise agreed in sales order or sales contract.

3. Version Update

Users can obtain the latest document of the corresponding models when ordering Geehy products.

If the contents in this document are inconsistent with Geehy products, the agreement in thesales order or the sales contract shall prevail.

4. Information Reliability

The relevant data in this document are obtained from batch test by Geehy Laboratory or cooperative third-party testing organization. However, clerical errors in correction or errors caused by differences in testing environment may occur inevitably. Therefore, users should understand that Geehy does not bear any responsibility for such errors that may occur in this document. The relevant data in this document are

only used to guide users as performance parameter reference and do not constitute Geehy's guarantee for any product performance.

Users shall select appropriate Geehy products according to their own needs, and effectively verify and test the applicability of Geehy products to confirm that Geehy products meet their own needs, corresponding standards, safety or other reliability requirements. If loses are caused to users due to the user's failure to fully verify and test Geehy products, Geehy will not bear any responsibility.

5. Legality

USERS SHALL ABIDE BY ALL APPLICABLE LOCAL LAWS AND REGULATIONS WHEN USING THIS DOCUMENT AND THE MATCHING GEEHY PRODUCTS. USERS SHALL UNDERSTAND THAT THE PRODUCTS MAY BE RESTRICTED BY THE EXPORT, RE-EXPORT OR OTHER LAWS OF THE COUNTIRIES OF THE PRODUCTS SUPPLIERS, GEEHY, GEEHY DISTRIBUTORS AND USERS. USERS (ON BEHALF OR ITSELF, SUBSIDIARIES AND AFFILIATED ENTERPRISES) SHALL AGREE AND PROMISE TO ABIDE BY ALL APPLICABLE LAWS AND REGULATIONS ON THE EXPORT AND RE-EXPORT OF GEEHY PRODUCTS AND/OR TECHNOLOGIES AND DIRECT PRODUCTS.

6. Disclaimer of Warranty

THIS DOCUMENT IS PROVIDED BY GEEHY "AS IS" AND THERE IS NO WARRANTY OF ANY KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, TO THE EXTENT PERMITTED BY APPLICABLE LAW.

GEEHY WILL BEAR NO RESPONSIBILITY FOR ANY DISPUTES ARISING FROM THE SUBSEQUENT DESIGN OR USE BY USERS.

7. Limitation of Liability

IN NO EVENT UNLESS REQUIRED BY APPLICABLE LAW OR AGREED TO IN WRITING WILL GEEHY OR ANY OTHER PARTY WHO PROVIDE THE DOCUMENT "AS IS", BE LIABLE FOR DAMAGES, INCLUDING ANY GENERAL, SPECIAL, DIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF THE USE OR INABILITY TO USE THE DOCUMENT (INCLUDING BUT NOT LIMITED TO LOSS OF DATA OR DATA BEING RENDERED INACCURATE OR LOSSES SUSTAINED BY USERS OR THIRD PARTIES).

8. Scope of Application

The information in this document replaces the information provided in all previous versions of the document.