SFLY® 硕飞

SP10A/SP10B/SP10F

Programmer User Manual

深圳硕飞科技有限公司
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CONTENTS

Chapter 1 Introduction

SP10 series (SP10A/SP10B/SP10F) programmers are the latest highspeed mass production programmers for SPI FLASH launched by Shenzhen SFLY Technology. It is the upgraded version of SP8 series, which can support supports the high-speed programming of SPI NOR FLASH, I2C / MicroWire and other EEPROMs from domestic and foreign manufacturers.

1.1 Performance Characteristics

Hardware features

- USB Type-C communication interface, no need for external power supply when used in USB mode;
- Support USB mode mass-production programming: automatically detects the chip insert and remove,and automatically starts programming; (Note: SP10A does not have this function)
- Support standalone programming: no need to connect to a computer when programming, built-in large-size memory saves the project data, multiple CRC data validation ensures that the programming data is absolutely accurate; (Note: only SP10F has this function)
- 28-pin ZIF socket, universal programming sockets are supported;
- RGB three-color LED indicates the working status, the SP10F can also indicate the success and failure via a buzzer;
- Support poor pin contact detection, effectively improve programming reliability;
- Short circuit / overcurrent protection function can effectively protect the programmer or chip from accidental damage;
- Programmable voltage design, adjustable range from 3.3V to 5.0V, can support 3.3V-5V chips;
- Provide equipment self-check function;
- Small size (size: 108x76x21mm), simultaneous programming of multiple machines only takes up a very small work surface;

Software features

- Support Win7/Win8/Win10/Win11;
- Support switching between Chinese and English;
- Support software upgrade to add new devices;
- Support project file management (project file saves all programming parameters, including: chip model, data file, programming settings, etc.);
- Support the reading and writing of additional storage area (OTP area) and configuration area (status register, etc.) of the chip;
- Support automatic recognition of 25 series SPI FLASH;
- Automatic serial number function (can be used to generate product unique serial number, MAC address, Bluetooth ID, etc.,);
- Support multi-programmer mode connection: one computer can be connected with 8 SP10B/SP10F programmers for simultaneous programming,The automatic serial number function is active in multi-programmer mode; (Note: SP10A does not have this function)
- support 8 SP10F to download standalone data at the same time;
- Support log file saving;

Note:
The above functions depend on the product model. For details, please refer to the product parameter table in section 1.2

1.2 SP10 series programmer parameter table

Product parameter	SP10F	SP10B	SP10A
Product Appearance			
Supported chip voltage range	3.3-5V	3.3-5V	3.3-5V
Maximum memory of supported chips	512Mb	512Mb	256Mb
Support chip series (interface type) (① I2C EEPROM ② Microwire EEPROM ③ SPI Flash)	①②③	①②③	①②③
Multi connection (One computer can connect 8 programmers)	Y	Y	N
Mass production with USB (Auto detect the chip insert and remove, auto programmer)	Y	Y	N
Automatic serial NO. (Serial numbers programming)	Y	Y	Y
RGB LEDs work indicator	Y	Y	Y
Buzzer prompt	Y	Y	N
Standalone programming (programming without computer, suitable for mass production)	Y	N	N
Programming speed (Programming + verification) Full data — GD25Q16(16Mb)	6s	6s	7s
Programming speed (Programming + verification) Full data — W25Q64JV(64Mb)	25s	25s	28s
Programming speed (Programming + verification) Full data — W25Q128FV(128Mb)	47s	47s	52s

"Y" means it has or supports the function, "N" means it does not have or does not support the function

Chapter 2   Programmer Hardware

2.1 Product Overview

Item	Name	Illustrate
①	28P ZIF socket	Insert DIP packaged chip or programming socket (Note: Does not support programming of on-board chips by connecting wire from the ZIF socket.)
②	Three color indicator	Blue: BUSY; Green: OK(successful); Red: FAIL
③	USB interface	USB Type-C interface

2.2 Product Add-ons

Type-C data cable   5V/1A power adapter   Warranty card

● The color/appearance of accessories of different batches may be different, please refer to the actual product;

● SP10A/SP10B does not include a power adapter, just use the USB port for power supply;

● The standard configuration of the programmer does not include a programming socket, please choose according to your needs;

Chapter 3   Quick To Use

This chapter takes a piece of SOIC8 (208mil) packaged SPI FLASH chip GD25Q127C as an example to introduce the SP10F programmer's method of programming the chip in USB mode. The conventional programming includes the following 5 steps:
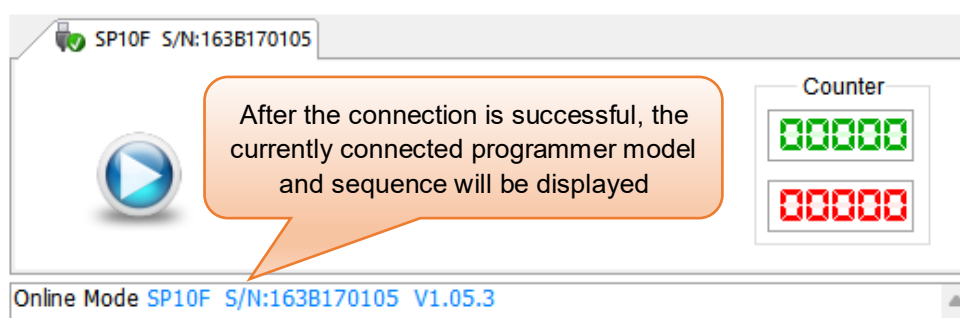
Software and hardware preparation ⇨ Select chip model ⇨ Load file ⇨ Operation option settings ⇨ programming

3.1 Preparation work

1) Install "SFLY FlyPRO II" series programmer software (includes USB driver, the USB driver will be installed by default when installing the software), support Win7/Win8/Win10/Win11,
the software download URL: http://www.sflytech.com;
2) Connect the programmer to the USB port of the computer with a USB cable, and the green light of the programmer will be on when the connection is normal;
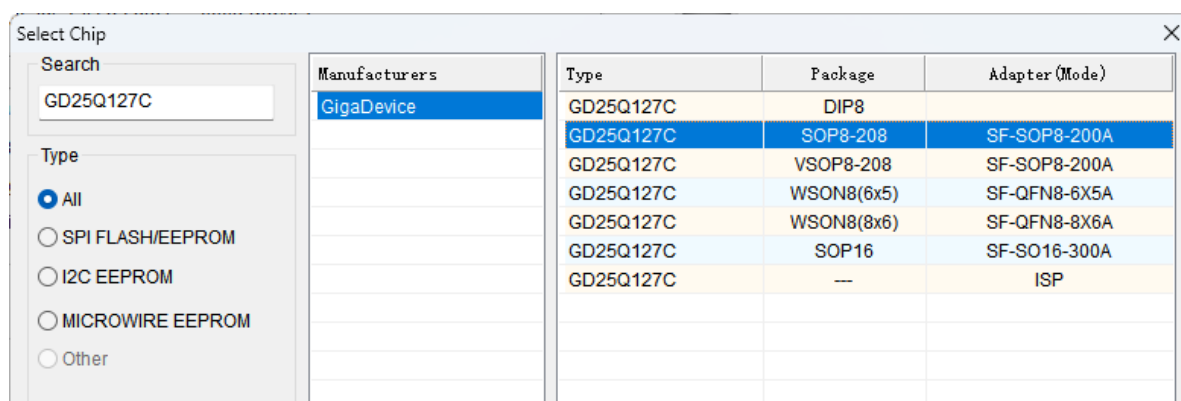
Connect to the computer USB port

3) Start the programmer software "SFLY FlyPRO II", the software will automatically connect to the programmer, and the right window of the software will display the programmer model and product serial number. If the connection fails: please check whether the USB cable is plugged in; check whether the USB driver is successfully installed in the computer device manager (if the USB driver is not installed correctly, please manually update the USB driver: locate the "USB_DRIVER" in the programmer software installation directory Folder, just update the driver);

SP10F S/N:163B170105

After the connection is successful, the currently connected programmer model and sequence will be displayed

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00000

Online Mode SP10F S/N:163B170105 V1.05.3

3.2 Programming your chip

1) Select the chip model:

Click the toolbar button [ ] Chip ▾ , and search for the chip model to be programmed in the pop-up dialog box for selecting chip model: GD25Q127C Select the matching chip brand, model and package type (selecting the wrong brand and model will result in programming failure).
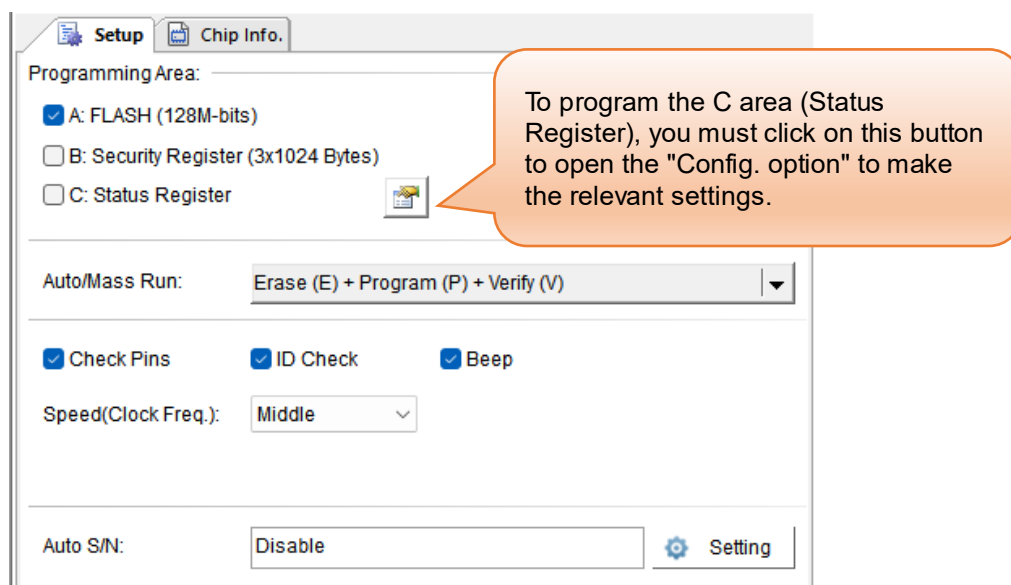
Select Chip

Search
GD25Q127C

Manufacturers	Type	Package	Adapter (Mode)
GigaDevice	GD25Q127C	DIP8	
	GD25Q127C	SOP8-208	SF-SOP8-200A
	GD25Q127C	VSOP8-208	SF-SOP8-200A
	GD25Q127C	WSON8(6x5)	SF-QFN8-6X5A
	GD25Q127C	WSON8(8x6)	SF-QFN8-8X6A
	GD25Q127C	SOP16	SF-SO16-300A
	GD25Q127C	---	ISP

Type
○ All
○ SPI FLASH/EEPROM
○ I2C EEPROM
○ MICROWIRE EEPROM
○ Other

2) Load file:

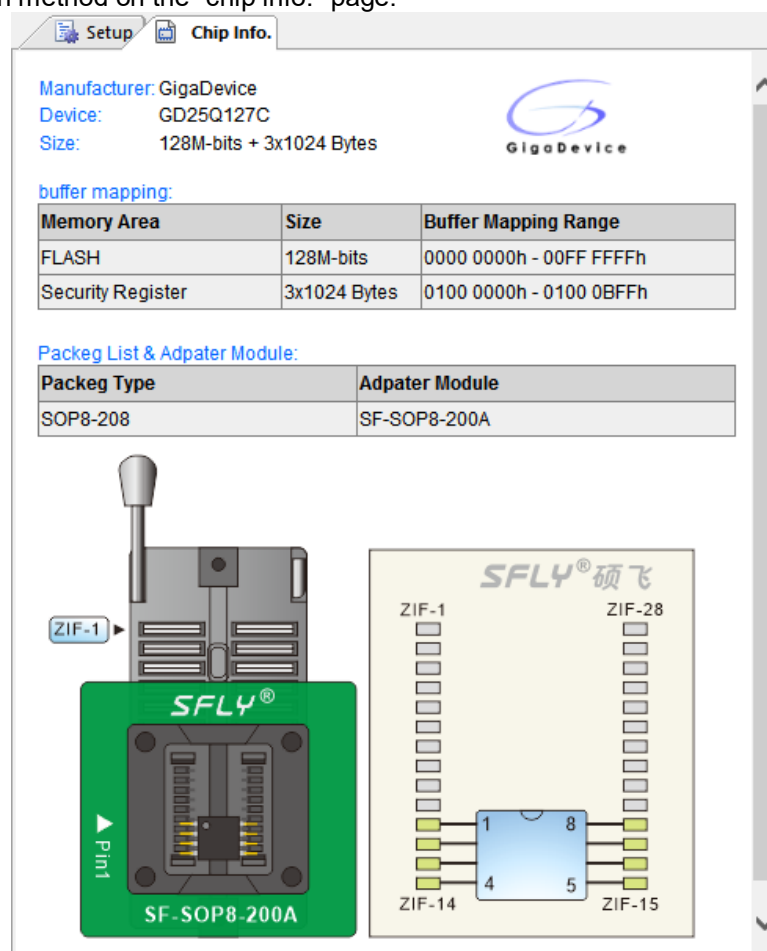Click the toolbar button [Load ▾] to load the data file, which can support Bin and Hex formats.

3) Operation option setup:

Make the corresponding settings on the "Operation Options" page as needed. **Tip:** The non-empty chip must be erased.

To program the C area (Status Register), you must click on this button to open the "Config. option" to make the relevant settings.
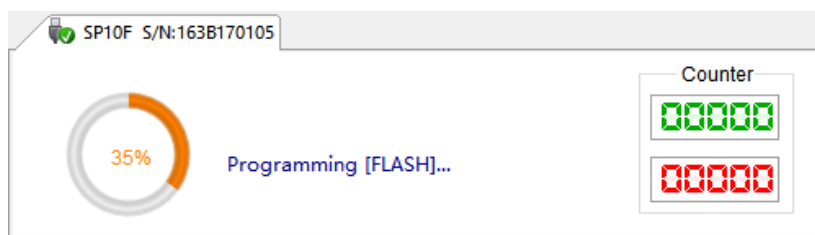
4) Place the chip:

Raise the handle of the ZIF socket, insert the bottom row of the programming socket aligned with the bottom of the ZIF Socket, press down the handle, and then put the chip into the programming socket. Note that the direction of pin 1 of the chip should not be placed in the wrong direction. **Tip:** You can view the corresponding programming socket model and insertion method on the "chip info." page.

5) Programming operation:

Click the toolbar button ▶ Auto to start programming:

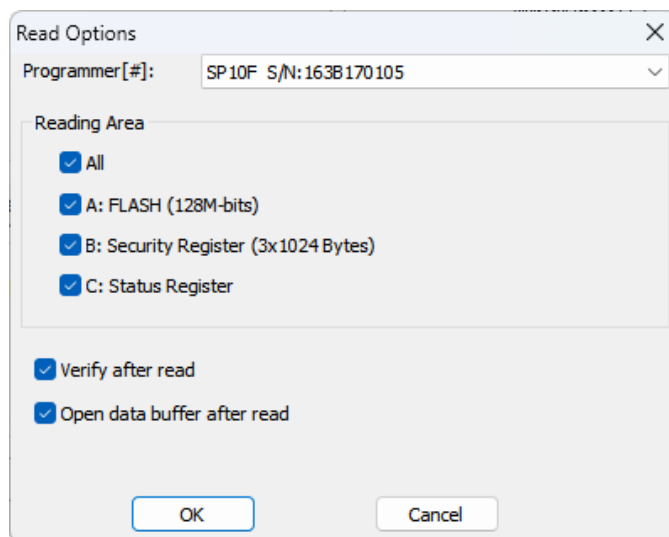When the programming is completed, the status icon changes to "OK" to indicate that the programming is successful:

3.3 Read chip data and programming new chip

1）Follow the steps in section 3.2 to select the chip model, install the socket and the chip to be read;
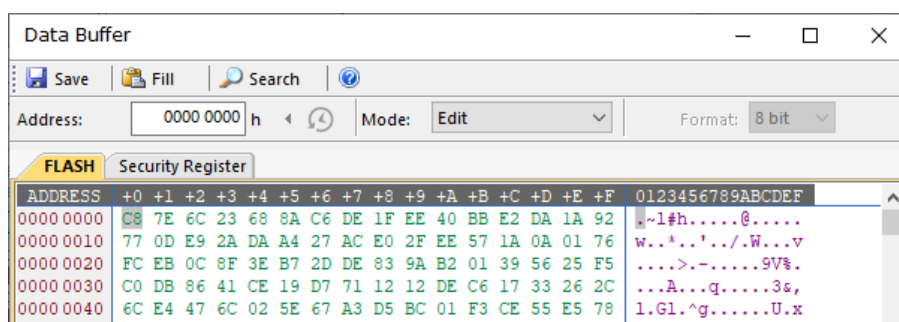
Tips:

① You can automatically identify most SPI Flash chips through the "Check Model" button in the toolbar;
② The pins of the desoldered chip need to be cleaned up to avoid poor contact;

2) Click the read button in the toolbar, and the "Read Options" dialog box will pop up;

3) Click the "OK" button, the programmer will automatically open the "Data Buffer" after reading the chip data, and click the "Save Data" button to save the read data to the computer for subsequent use;

4) Click the "Save Data" button of the "Data Buffer", the Save Data dialog box pops up, the default save all the storage area, you can select the memory area as needed, such as the main memory area Flash, save the file can be used later;

5) Close the "data buffer" and put in a new chip of the same model;

6) Click the button ▶ Auto to write the read content into the new chip.

Tip:
① Select all programming areas in the Setup options, otherwise the pramming data may be incomplete and the master chip may work normally, but the copied chip may not work normally;
② After setting the programming parameters or successfully reading the data of the mother chip, you can save it as a project file (click the toolbar [icon] button, or click the menu bar: File->Save Project), and then you only need to load the saved project file, and do not need to reset the parameters in order to programming the new chip.

3.4 Indicator status in USB mode

Indicator status	State description
Steady blue	Busy state, the programmer is performing operations such as erasing, programming, verification, etc.
Flashing blue	Wait for the chip to be put in
Steady green	Currently in standby mode, or the current chip is successfully programmed
Steady red	Chip programming failed (you can check the reason for the failure in the software information window)

⚠️ Does not support programming of on-board chips by connecting wire from the ZIF socket, because of the interference of the external circuit will lead to the failure of programming, and in the case of the external circuit board with electricity, it may also damage to the hardware of the programmer, if the programmer is damaged due to this incorrect use, it will not get the warranty service. Please use the standard programming socket to program the chip, or choose the SP20 series programmer (SP20 series programmers have ISP interface, which can support reading and writing on-board chips).

Chapter 4   Standalone Programming

SP10F support standalone (withourt computer) programming, suitable for mass production. The basic operation process is as follows:

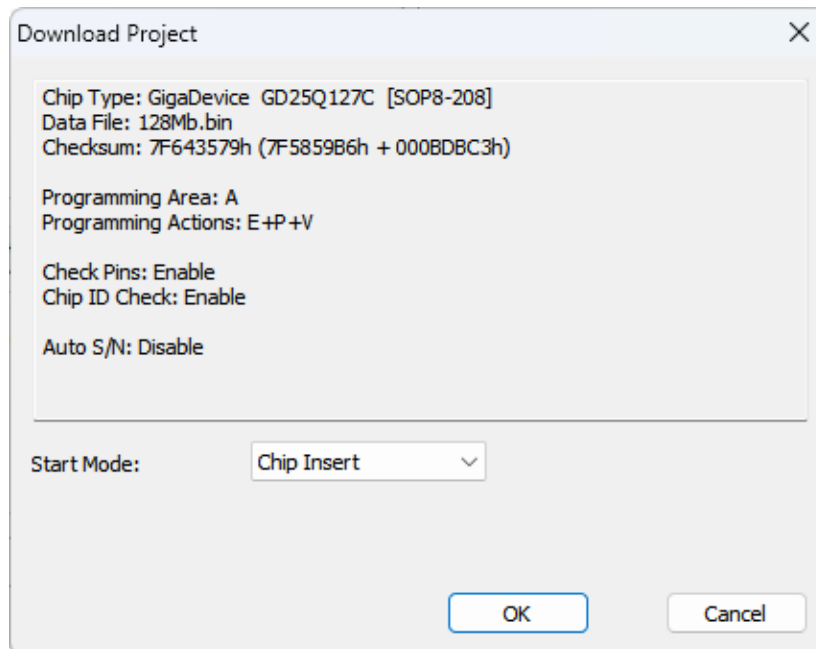Download standalone data ⇒ Disconnect the USB cable and connect to the 5V power supply ⇒
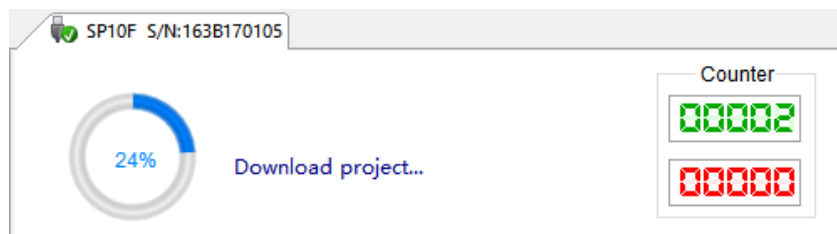
Start standalone programming

4.1 Download standalone data

1) Connect the programmer to the computer USB port with a USB cable, and start the "SFLY FlyPRO II" software;
2) Follow the steps in section **3.2** to select the chip model, load the data file, and set the necessary operation options;
3) In order to ensure that the standalone data is correct, you can first programming a few chips and do the actual verification of the product;

4) Click the button ⌗ to save the current project (Tip: the saved project file can be loaded and used later to avoid the trouble of repeated settings);

5) Click the button ⬇ to download standalone data, and the "Download Project" dialog box will pop up;

Download Project ✕

Chip Type: GigaDevice GD25Q127C [SOP8-208]
Data File: 128Mb.bin
Checksum: 7F643579h (7F5859B6h + 000BDBC3h)

Programming Area: A
Programming Actions: E+P+V

Check Pins: Enable
Chip ID Check: Enable

Auto S/N: Disable

Start Mode: Chip Insert   ⌄

OK   Cancel

6) Click OK to download the standalone data to the programmer's built-in memory
   Tips: standalone data will not be lost after the programmer is powered off, and you can continue to use it next time.

SP10F S/N:163B170105

Counter

24%   Download project...

00002

00000

4.2 Standalone programming operation

1) Download standalone data according to the method in section **4.1**;

2) Unplug the USB cable from the computer and connect it to the 5V power adapter. After the programmer is powered on, it will first check the internal standalone data to verify the integrity and accuracy of the data. This takes 3-25 seconds. If the test is passed, the indicator light flashes blue, indicating that the programmer has entered the standalone programming mode. If the test fails, the indicator shows a red flashing state, indicating that there is no valid standalone data in the programmer, and standalone programming cannot be started;

3) Put the chip to be programmed on the ZIF socket, the indicator light changes from flashing blue to steady blue, indicating that the programmer has detected the chip and is programming;

Connect to 5V power adapter for Standalone programming
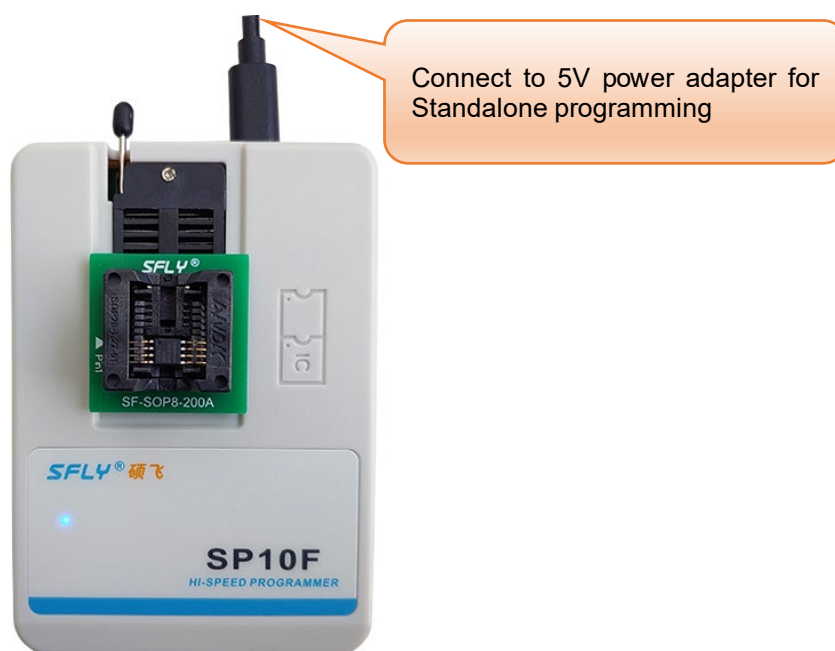
4) When the indicator light turns steady green, it means that the chip programming is completed and the programming is successful. If the indicator light turns red, it means that the current chip programming has failed. At the same time, the programmer waits for the current chip to be removed from the ZIF socket. If the buzzer prompt function is turned on, the programmer will beep when the programming is completed;

5) Take out the chip and put it in the next chip, repeat this step until the programming is completed.

## 4.3 Indicator status in standalone mode

| Indicator status	State description (manual method)
Flashing red	The programmer did not download standalone data
Flashing blue	Wait for chip placement
Blue	Programming chip
Green	The chip programming is completed and the programming is successful (Waiting for chip removal)
Red	Chip programming failed (Waiting for chip removal)

Chapter 5   Programming in Multi-machine Mode

The programmer software supports connecting up to 8 sets of SP10B/SP10F programmers on one computer for simultaneous operation (Note: SP10A does not support multi-machine mode), and supports 8 sets of SP10F programmers for simultaneous downloading of standalone data.

5.1 Hardware connection of programmer

1) Use USB HUB to connect multiple programmers to the computer's USB port (USB hub must have an external power adapter, and an external power supply is required). Note that in multi-machine mode, only programmers of the same model can be used together, and different models cannot be mixed.
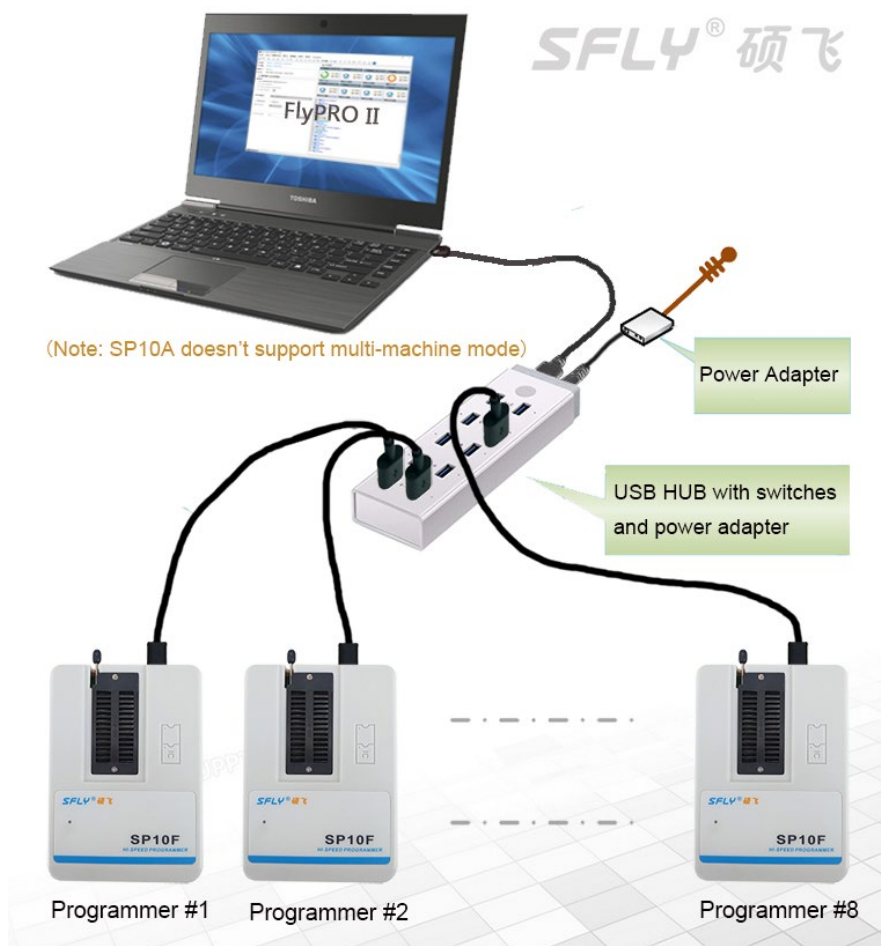
2) Start the programmer software, the software will automatically connect to all connected programmers and enter the multi-machine mode. If the programmer software is already running, you can click Menu → Programmer → Reconnect, and the software will pop up the "Connect to the programmer" dialog box:
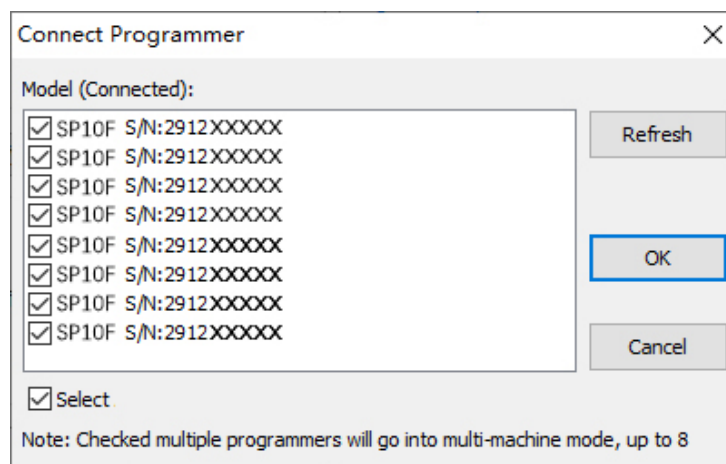
Select the programmer to be connected and click OK. After the connection is successful, the software enters the multi-machine mode, and the interface is as follows:


5.2 Programming operation

1) The programming operation is the same as the programming procedure in section 3.2: select chip model → load file → set operation options → install programming socket;

2) Click the [Mass Chip Insert] button, the programmer will wait for the chip to be placed;

3) Put the programmed chips in the programming socket one by one, and the programmer will automatically start programming after detecting that the chips are put in. Each programmer works independently, programming in full asynchronous mode, no need to wait for synchronization. The software programming interface is as follows;
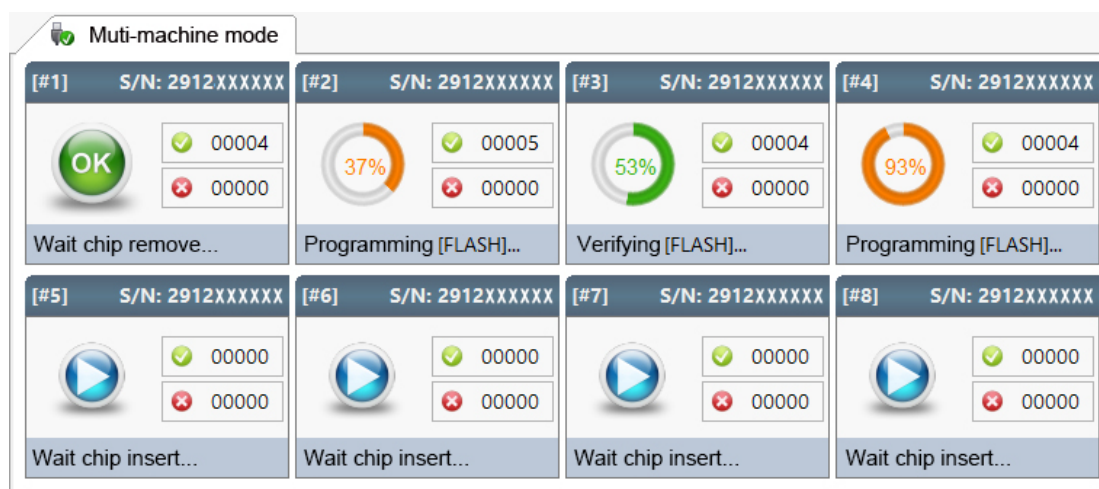
4) Pick and place the chips according to the indicator status description in Section **3.4** or the prompts on the display screen to complete the entire mass of chip programming.

Tips:

SP10 support standalone programming. You can use the existing USB port on the computer to connect one or more programmers to download standalone data, and then use the standalone method for mass programming. Compared with the USB method, it is more convenient and more efficient. SP10B does not support standalone and can only be connected to a computer for mass programming.

Appendix 1   FAQ

☹ Can the programmer support img files?

- The programmer software supports binary and hexadecimal file encoding formats. The conventional suffix of binary files is *.bin, and the conventional suffix of hexadecimal files is *.hex;
- img is just a file suffix, and does not represent the file encoding format. Normally (above 90%) such files are binary encoded. Just load it directly in the software, the software will automatically recognize whether the file is binary code, and load it in the recognized format;
- To ensure the accuracy of file loading, we recommend that users check the buffer checksum and file checksum with engineer (or file code providers/customers) after loading such files. (These information will be displayed at the bottom of the main window of the writer software.)

☺ What are the common reasons for programming failure (including erasing failure/programming failure/verification failure/ID error, etc.)?

- The chip manufacturer/model selected in the software does not match the actual chip;
- The chip is placed in the wrong direction, or the programming socket is inserted in the wrong position. Please check the correct placement method through the "Chip Information" window of the software;
- Poor contact between the chip pins and the programming socket;
- Connect chips that have been soldered on other circuit boards by wires or IC programming clips, which may cause programming failure due to circuit interference. Please put the chips back into the programming socket for programming;
- The chip may be damaged, replace with a new chip for testing.

☺ Why does the 24 series chip have no erase function?

- The chip is based on EEPROM technology, the chip data can be directly rewritten without pre-erasing, so there is no erasing operation available;
- If you need to clear the chip data, please write FFH data directly to the chip.

☺ How to upgrade the programmer software and firmware?

- Click the programmer software menu: Help-Check for updates. If there is an update, an update wizard will pop up. Please follow the prompts to download the upgrade package and install it;
- Enter the download center of Sfly official website (http://www.sflytech.com), download the latest programmer software and install it;
- Only need to upgrade the programmer software, no need to upgrade the programmer firmware.

☺ What should I do if there is no chip model in the programmer software?

- First upgrade the programmer software to the latest version;
- If there is no chip model to be programmed in the latest version of the software, please send an email to apply for addition. Indicate the following information: programmer model, chip brand to be added, detailed chip model, package (reminder: SP10 series programmers can only support SPI NOR FLASH, EEPROM, other types of chips cannot be supported).

Appendix 2　Disclaimer

Shenzhen Sfly Technology Co., Ltd. does its utmost to ensure the correctness of the product and its related software and materials. For possible product (including software and related materials) defects and errors, the company will do its best to solve the problem with its commercial and technical capabilities. The company is not responsible for all kinds of incidental, inevitable, direct, indirect, special, extended or punitive damages arising from the use or sale of this product, including but not limited to the loss of profit, goodwill, availability, Business interruption, data loss, etc., shall not be liable for any direct, indirect, incidental, special, derivative, punitive damages and third-party claims.

Appendix 3   Revision History

Release date	Version	Revised by	Illustrate
2024-05-07	A2	Sauwa	Update programmer parameter table in section 1.2
2024-01-02	A1	Sauwa	First edition