Introduction

PY-LINK emulator is a tool for online simulation programming and offline programming of Puya MCU. Provides a CMSIS-DAP debugger port with SWD interface, which can perform online emulation, programming and other related operations on the target chip in the MDK environment. Support Puya programmer host computer to download the program to the target board through SWD or ISP online, and support the host computer to burn the configuration to PY-LINK for offline programming.

Contents

1 Features

- USB interface provides 5V power supply
- USB 2.0 full speed compatible interface
- 20 -pin 2.54mm pitch connector
- Firmware online upgrade function
- Operating temperature from 0°C to 50°C
  - Support online debugging function
  - Support running on MDK environment
- Support serial debug SWD (Serial Wire Debug) interface
  - Support Programming function
  - PY32F0xx in the MDK environment.
- Single file Programming in offline mode
- Supports power supply to PY32F0xx
  - 200mA supply current
  - 3.3V and 5V supply voltage
- any voltage programming in the range of external input 1.7V to 5.5V
- SWD rate up to 4MHz

2 Instructions

The definition of the hardware pin is shown in Figure 2-1 PY-LINK pin definition

Figure 2-1 PY-LINK pin schematic and physical map

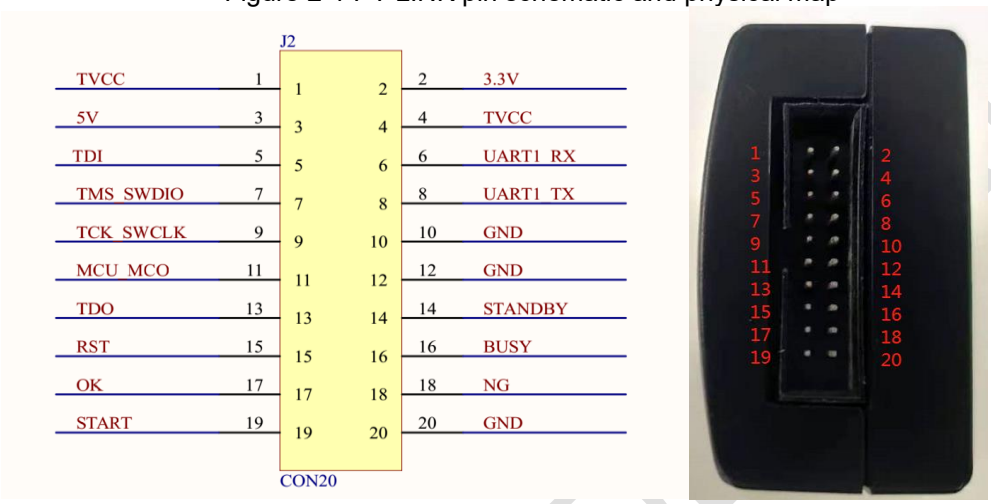


Table 2-1 Pin definition

Pin	Name	Type	Description
1	TVCC	Power	power supply
2	3.3V	Output	3.3V power output port
3	5V	Output	5V power output port
4	TVCC	Power	power supply
5	TDI	/	Reserved
6	RX	/	Reserved
7	TMS_SWDIO	Input /Output	data line
8	T X	/	Reserved
9	TCK_SWCLK	Output	clock line
10	GND	Power	power ground
11	MCU_MCO	/	Reserved
12	GND	Power	ground
13	TDO	/	Reserved
14	STANDBY	/	Reserved
15	RST	Output	reset signal
16	BUSY	/	Reserved
17	OK	/	Reserved
18	NG	/	Reserved
19	START	/	Reserved
20	GND	Power	ground

Note: 1. If the target board has voltage, it needs to be connected to the TVC pin, and the voltage of the target board should be (between 1.7V-5V).

2. If the target board has no voltage, you can use PY-LINK to supply power to the target board (3.3V or 5V). At the same time, you need to use a jumper cap to short the selected voltage to the TVC Pin. PY-LINK can provide 200mA of current.

3 Device Connection

Online programming can realize real-time online programming of the target board on the PC side, and PY-LINK can realize MDK online programming and Puya Programmer host computer online programming.

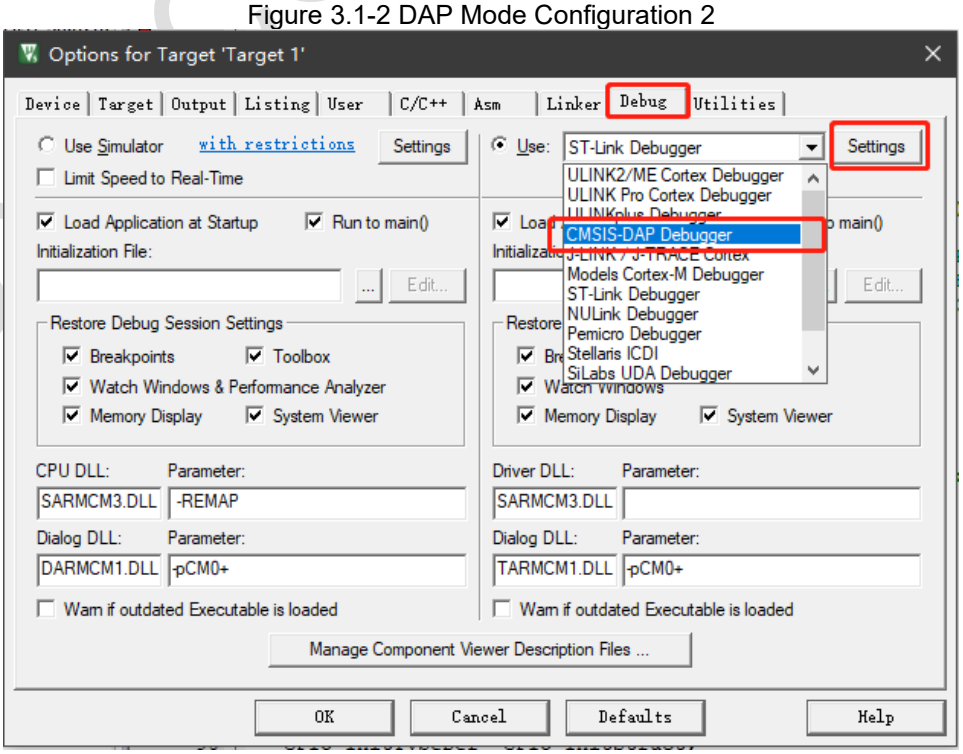
3.1 MDK online programming

MDK online programming requires the user to have the MDK source program of the entire project, and then realize the programming of the target board through the following configuration. When using PY-link in the MDK environment, you need to configure the corresponding usage environment. The configuration process is as follows

Click "Project" -> "Options for Target ' Project name ' ... " -> " Debug " , then click setting to select CMSIS-DAP Debugger as shown in Figure 3-1 and Figure 3-2 DAP mode configuration. to configure DAP mode.

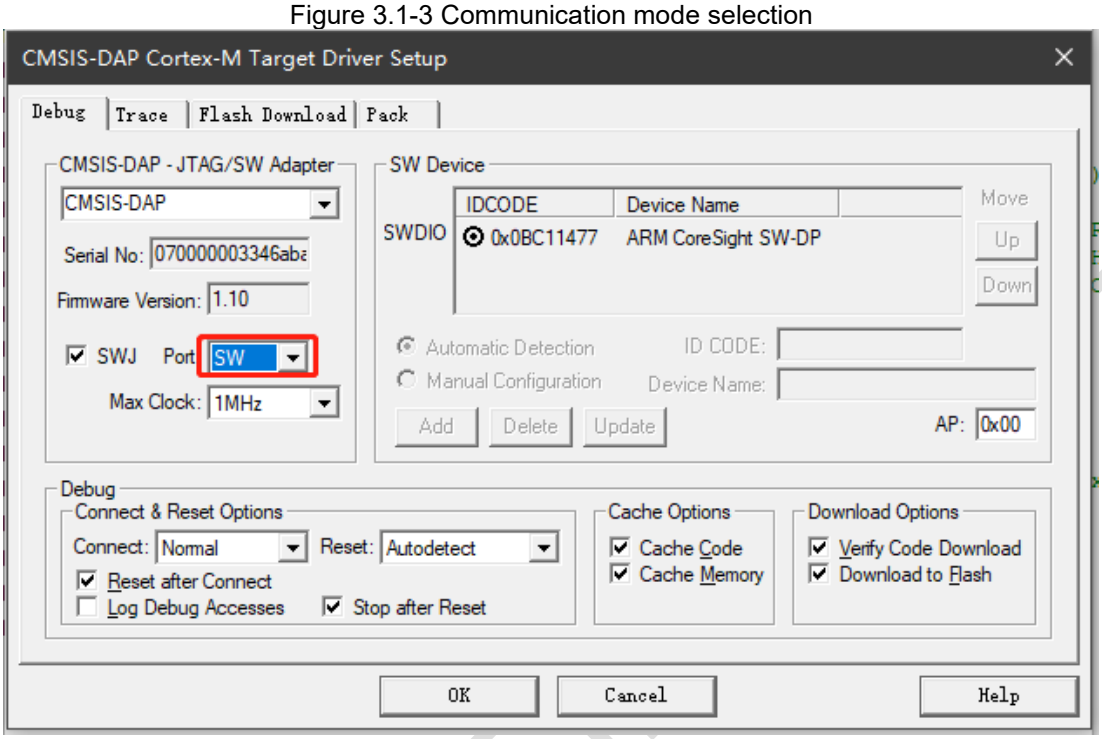
Figure 3.1-1 DAP Mode Configuration 1

Figure 3.1-2 DAP Mode Configuration 2



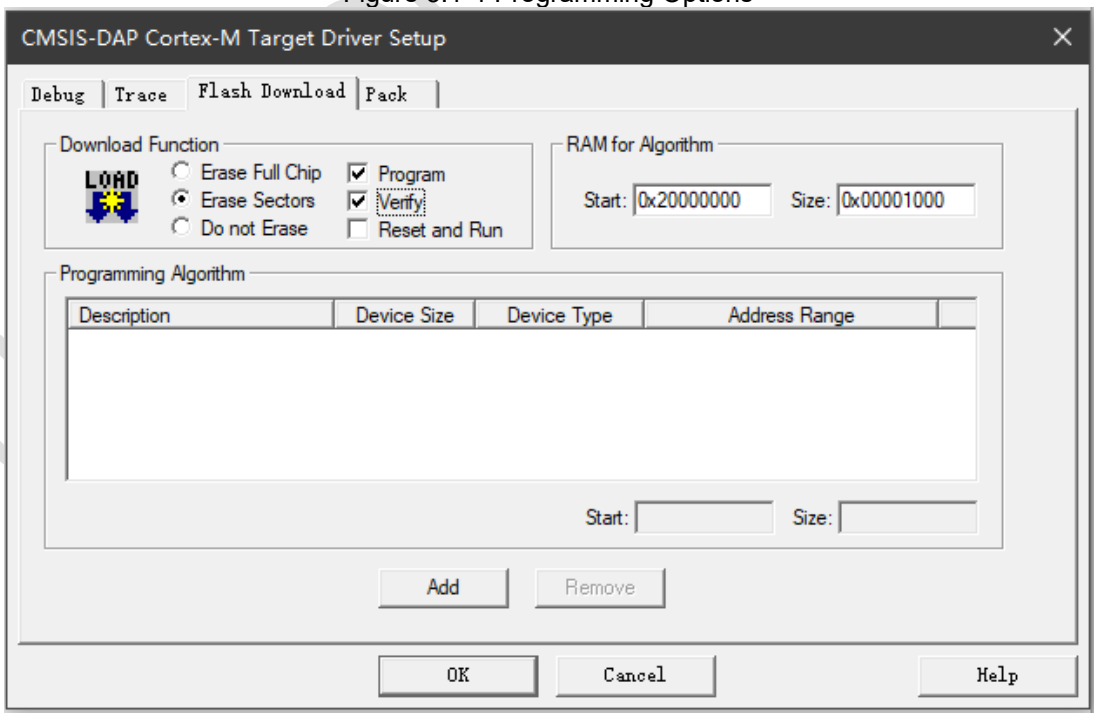
Click Settings and select SW, as shown in Figure 3.1-3 Communication Mode Selection

Figure 3.1-3 Communication mode selection



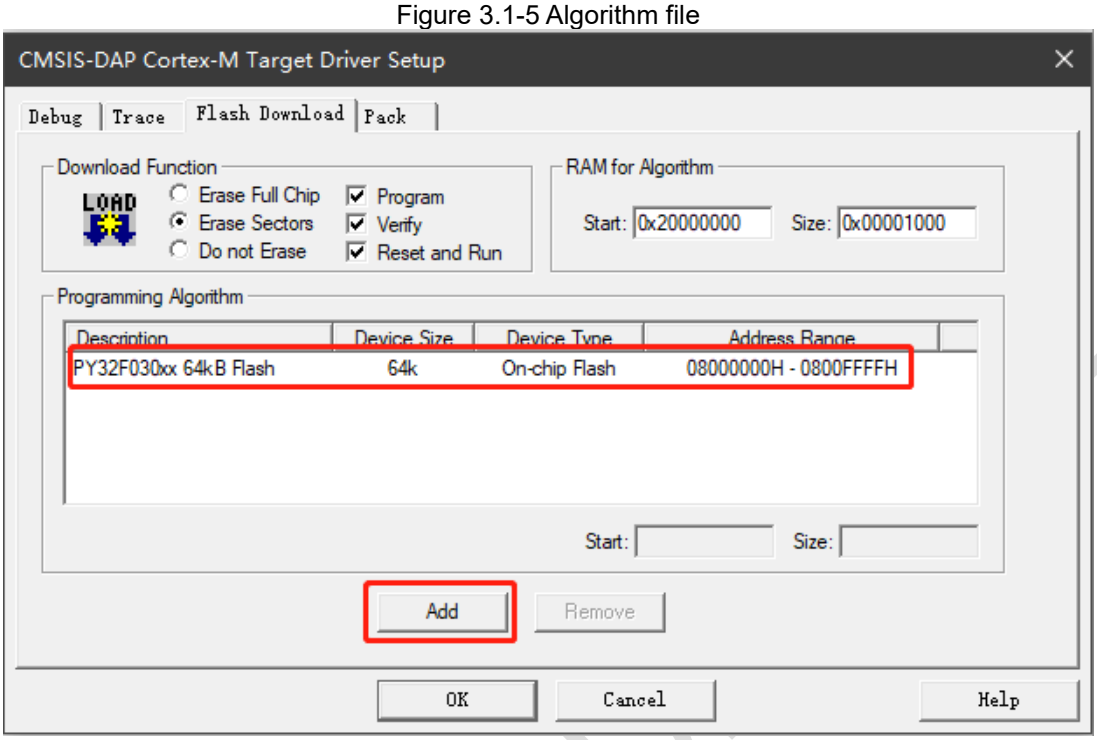
Then click Flash Download to configure erase, verify, and program as needed, as shown in Figure 3.1-4 programming options:

Figure 3.1-4 Programming Options



Click Add to load and download the algorithm file, the algorithm file of P32F030 is loaded in the figure, as shown in Figure 3.1-5 algorithm file:

Figure 3.1-5 Algorithm file



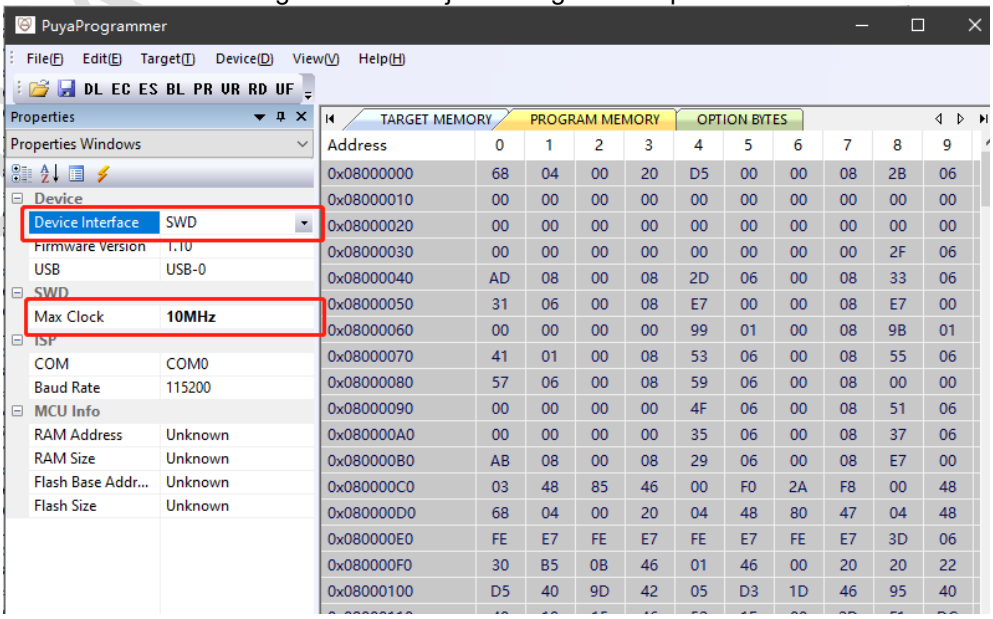
3.2 PUYA PROGRAMMER host computer online programming

When using the Puya Programmer host computer to program online, the user only needs to have the hex file of the project. The specific operation process is as follows.

Step 1: Configure Project configuration options

Configure the communication mode and communication speed in the project Windows column of the host computer. The SWD mode is configured in the figure, and the speed is 10Mhz as shown in Figure 3.2-1 Project configuration options. When the download is unstable, it is recommended to reduce the speed appropriately before proceeding with the following operations. The recommended speed is between 500Khz-10Mhz.

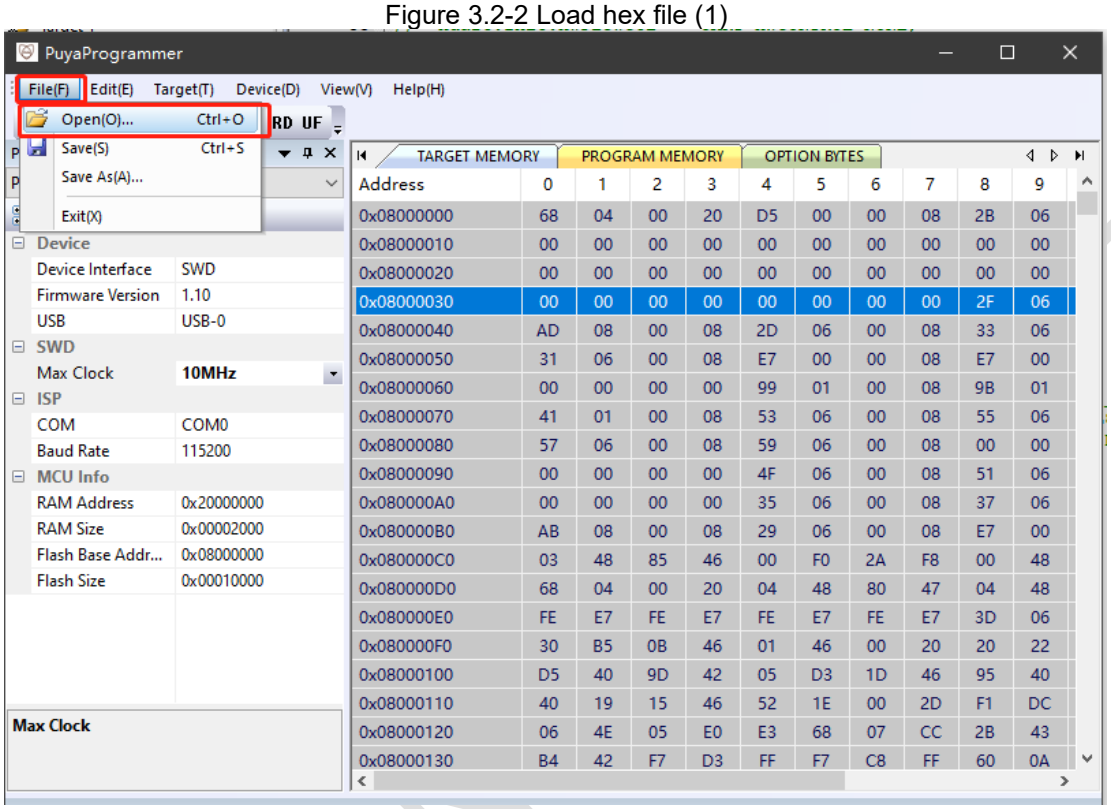
Figure 3.2-1 Project configuration options



Step 2: Load the hex file

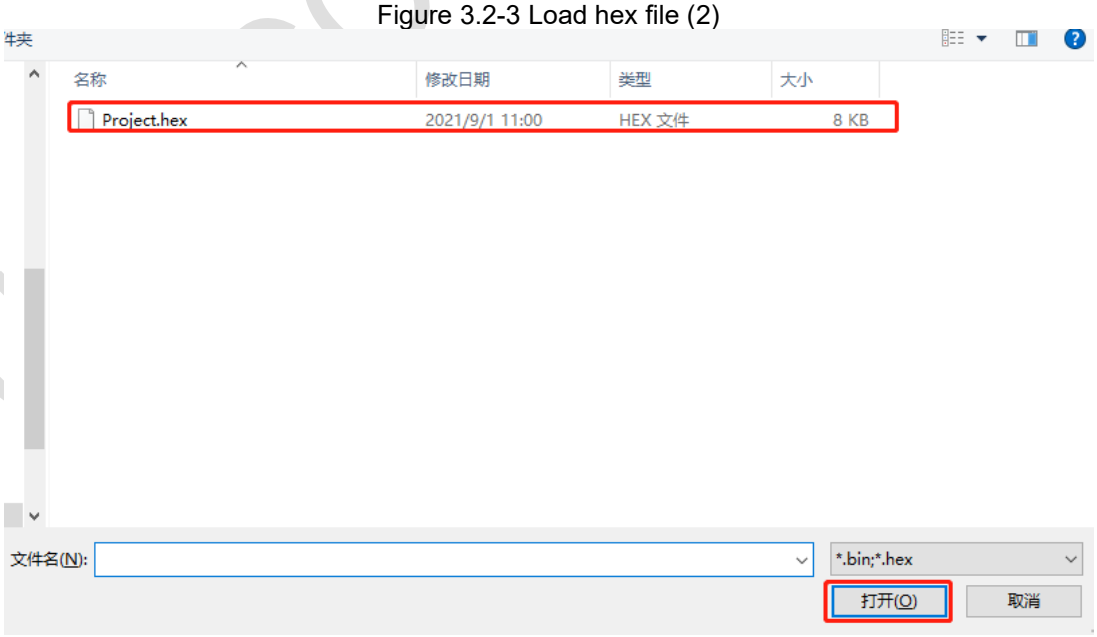
First click “ File(F) ” -> “ Open(O)... ” , as shown in Figure 3.2-2 to load the hex file (1) :

Figure 3.2-2 Load hex file (1)



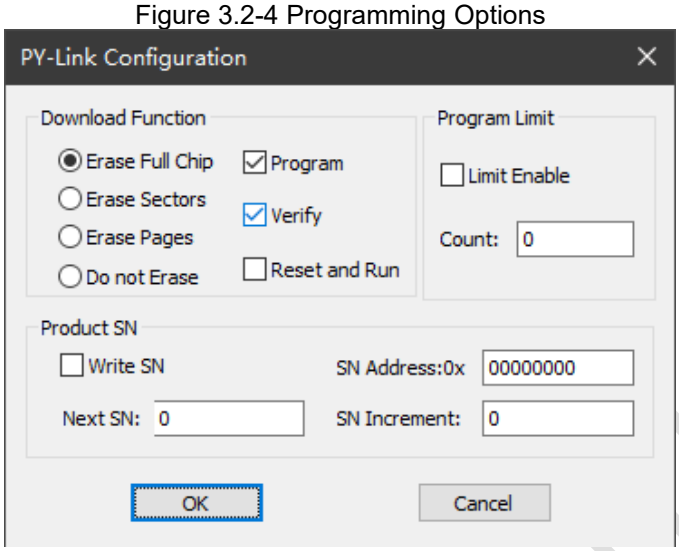
Then find the hex to be loaded, first click the hex file, and then click "Open", as shown in Figure 3.2-3 to load the hex file (2).

Figure 3.2-3 Load hex file (2)



Step3: Configure programming options
Click " Device " -> " Configuration ". and then configure erase, program and verify as required, as shown in Figure 3.2-4 programming options.

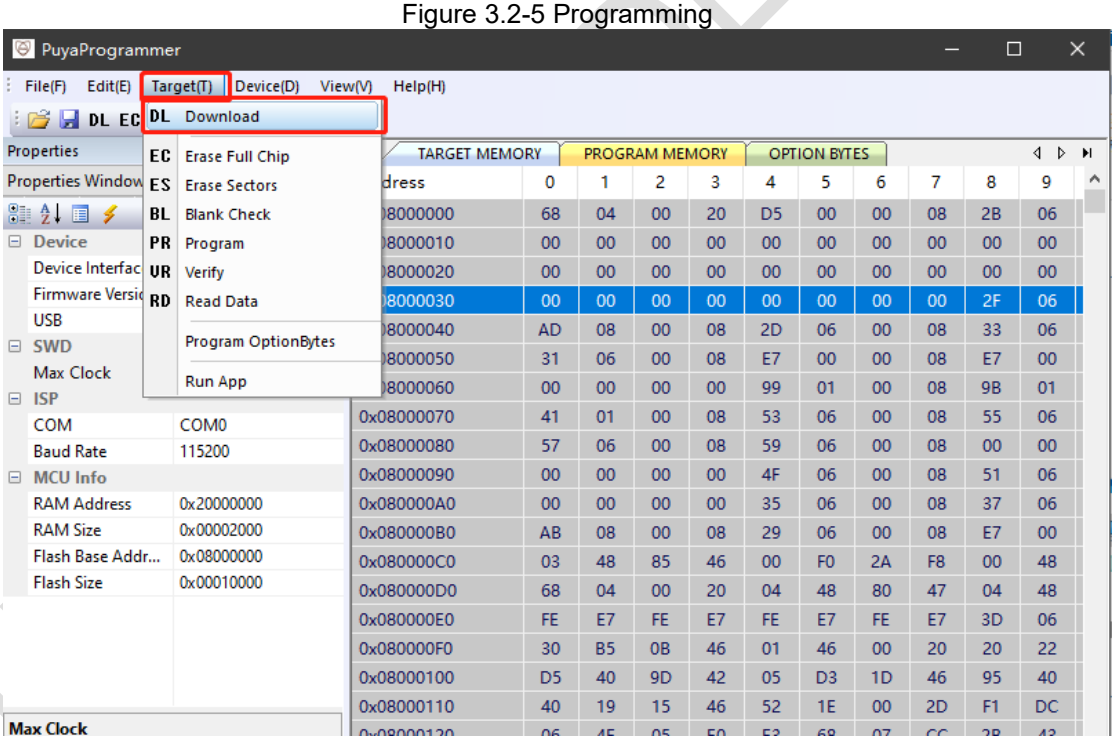
Figure 3.2-4 Programming Options



Step4: Programming

Click " Target " -> " Download " to complete the programming of the target board, as shown in Figure 3.2-5 programming.

Figure 3.2-5 Programming



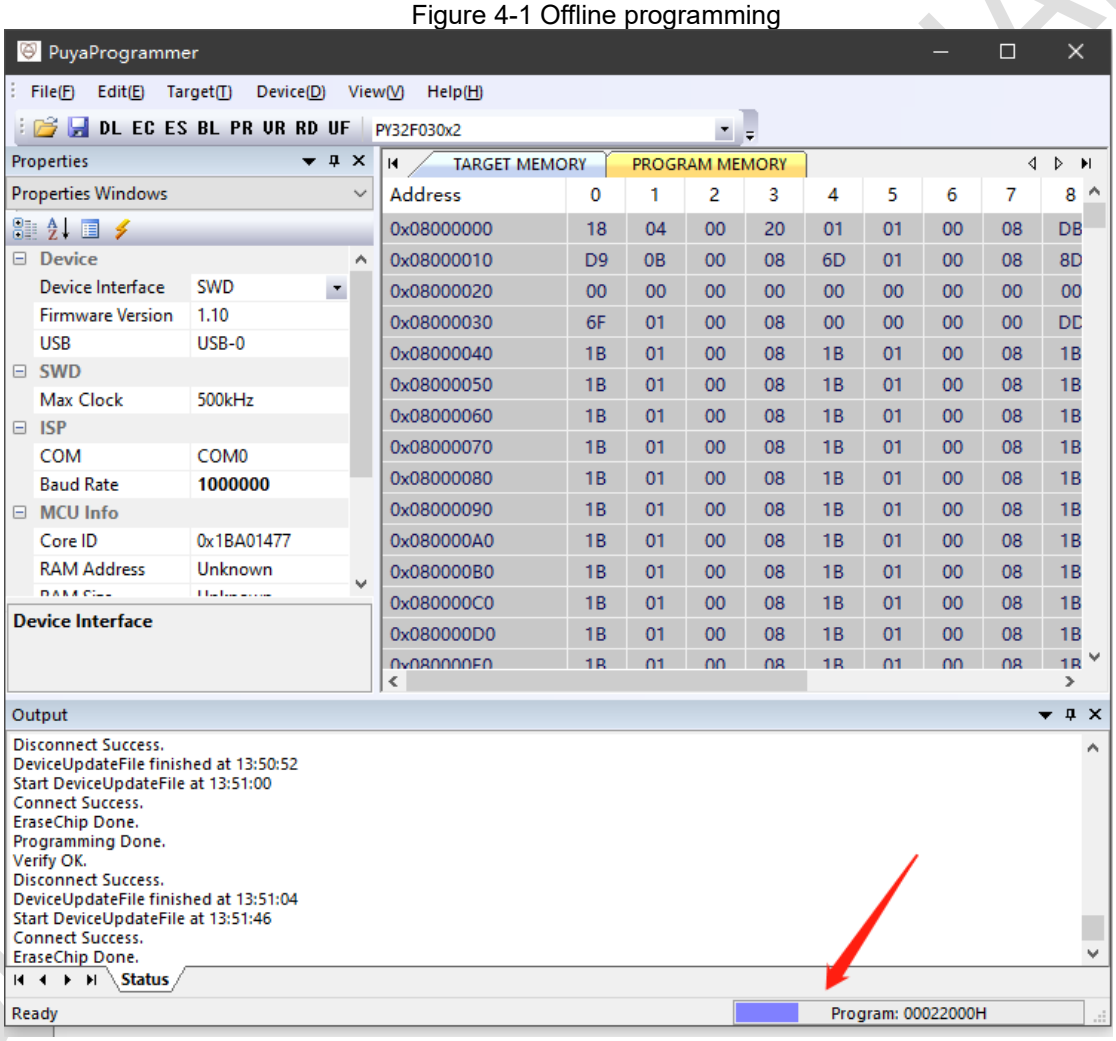
Target on the main interface, select the click operation as required. The meanings of the corresponding buttons are as follows

- Erase Full Chip: Erase the chip in the way of full erase
- Erase Sectors: Erase chips by sector
- Blank check: blank check chip
- Program: Program the chip
- Verify: Check chip
- Read Data: Read chip data
- Download: Operate according to the configuration mode in " Device " -> " Configuration “, as shown in Figure 3.2-4 programming options, click to execute the selected configuration item.

4 Puya Programmer offline programming

Configure the communication method and communication speed in the project Windows column of the host computer, then click " Device " -> " Configuration ", and then configure the erasing, programming and verification methods according to your own needs (the operation is online with the Puya Programmer host computer). The programming options for programming are the same), and then click " Device " -> " Update File " to wait for the code burning to complete, as shown in Figure 4-1 Offline programming. Finally, after connecting the target board, you can click the button to perform offline programming.

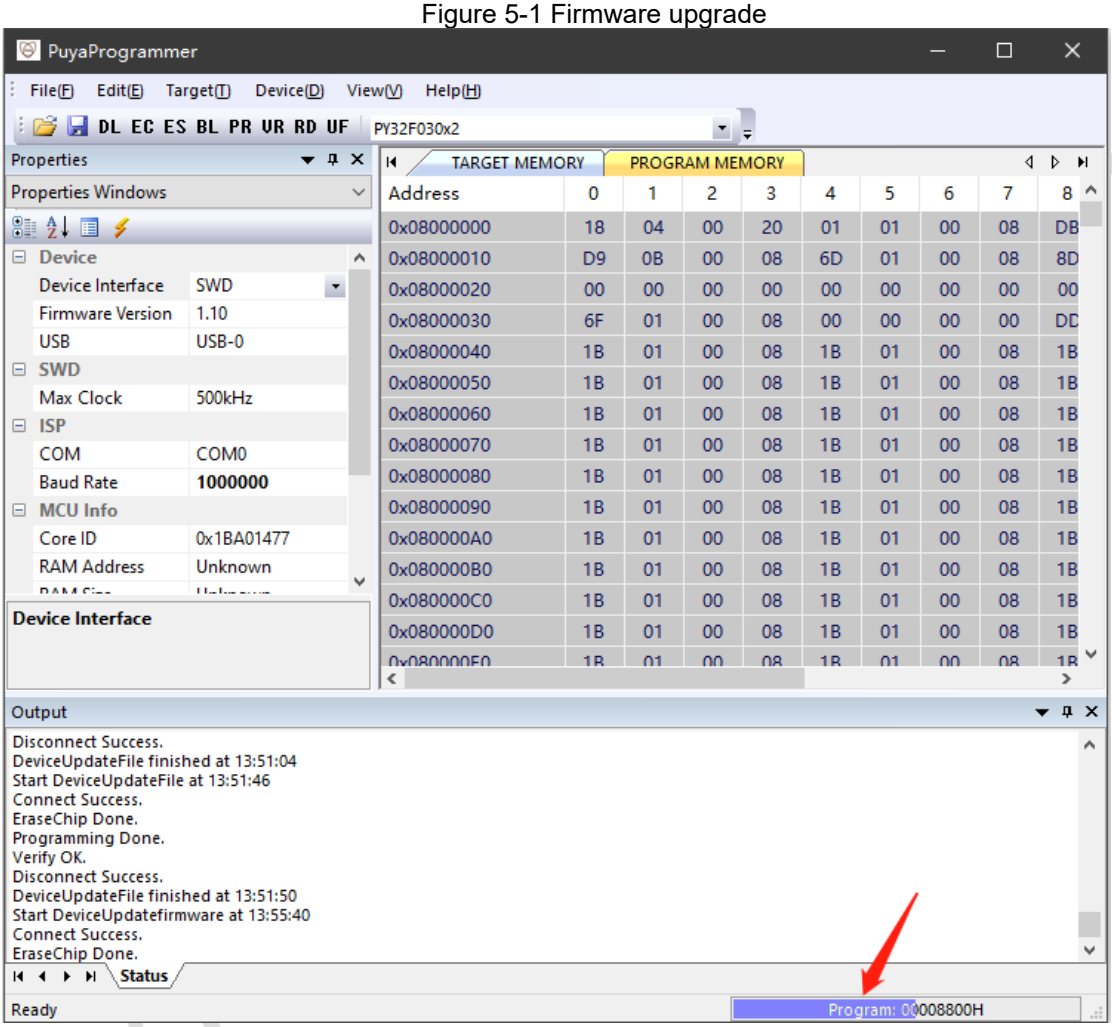
Figure 4-1 Offline programming



5 PY-LINK firmware upgrade

If PY-LINK needs to be upgraded, click " Device " -> " Update Firmware " to wait for the upgrade to complete, as shown in Figure 5-1 Firmware upgrade.

Figure 5-1 Firmware upgrade



6 Version history

Version	Content	Date
Rev 0.1	Initial Release	2021-09-15
Rev 1.0	Update 5.	2021-08-31

Puya Semiconductor Co., Ltd.