UM1504
User Manual

PY32™ DFU Tool Software Description

Preface

This document describes the installation and use of the PY32DfuTool software. This software can rewrite the FLASH and option bytes of the PY32 MCU by using the USB peripheral of the MCU and the bootstrap program embedded in the PY32 MCU System Memory. It supports erase, download, verify and read functions.

This software can also be nested in Keil MDK software for easy development and debugging.

Table 1: Applicable products

Type	Product Line
Micro controller series	PY32F072, PY32F071, PY32F403

Catalog

1 Bootstrap procedure

1.1 Device related bootstrap program parameters

Table 1-1. Device related bootstrap program parameters

MCU	USB	RCC(MHz)	PID	BL ID	SRAM	System Memory
PY32F071 PY32F072	USB_DM: PA11 USB_DP: PA12	PLL_48 (HSI_24 x 2)	0x0448	0xA0	0x20000000 - 0x200007FF	0x1FFF0000 - 0x1FFF2F00
PY32F403	USB_DM: PA11 USB_DP: PA12	PLL_48 (HSI_8 x 6)	0x0413	0xA0	0x20000000 - 0x200007FF	0x1FFF0000 - 0x1FFF4F00

1.2 Cautions

This application only supports Windows 64-bit operating systems.

2 Software Installation

This software is green and free to install, unzip it and double click PY32DfuTool_x64.exe to use it.

Figure 2-1. PY32DfuTool main interface

3 Hardware Connection

Before hardware connection, please make sure the MCU's BOOT0 pin is connected high, nBOOT1 is 1, and select System memory as boot area.

Table 3-1. Boot Configuration

Boot mode configuration		Mode
nBOOT1 bit	BOOT0 pin	
X	0	Select Main flash as the boot area
1	1	Select System memory as boot area
0	1	Select SRAM as boot area

The boot loader program is stored in System memory and is used to download Flash programs via USART/I2C/USB interfaces.

When using DFU software, please connect the MCU to the USB port of PC via USB cable.

4 Software Use

4.1 Device Selection

Figure 4.1-1. Selecting DFU devices

4.2 Open file

The software supports opening files in both *.hex/*.bin formats.

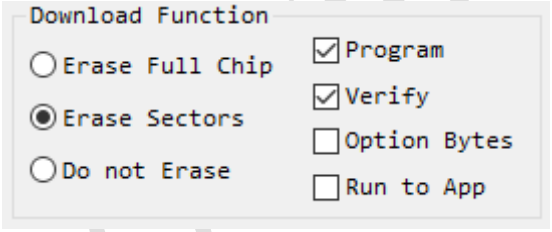
If the software opens a file in hex format, the software automatically sets the programming start address and the program run address.

If the software opens a bin format file, the software sets the programming start address and the program run address to 0x08000000.

Figure 4.2-1. Open file

4.3 Download Settings

Figure 4.3-1. Download settings



- Erase Full Chip

"Erase Full Chip" means mass erase, which corresponds to the whole address area of Main Flash.

If you check this box, clicking the "Download" button will perform the Erase Full Chip operation.

- Erase Sectors

The software automatically adjusts the sectors to be erased according to the loaded program code.

If you check this box, clicking the "Download" button will perform the Erase Sectors operation.

- Do not Erase

"Do not Erase" applies to both of the following cases:

  - The area of the chip to be programmed has been erased
  - SRAM Programming

If you check this box, clicking the "Download" button will not execute the Erase operation.

- Program

If you check this box, clicking the "Download" button will execute the Program operation.

- Verify

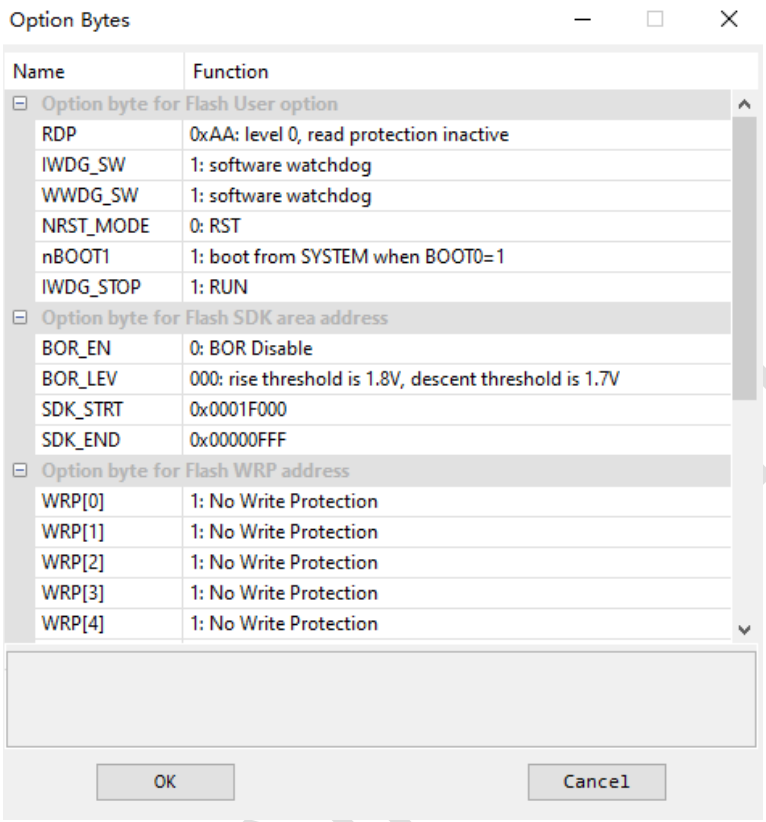
If you check this box, clicking the "Download" button will perform the Verify operation.

- Option Bytes

By default, the software only performs erase, write, and read operations on the Main Flash area.

If you check this box, clicking the "Download" button will perform the write Option Bytes operation.

Figure 4.3-2. Setting Option Bytes



- Run to App

If this is checked, clicking the "Download" button will cause the MCU to jump from the bootstrap program area to the user program area.

4.4 Software Operation

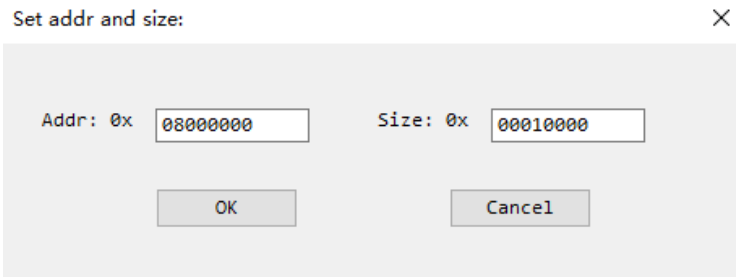
- Run to App

If this button is clicked, it will cause the MCU to jump from the bootstrap program area to run in the user program area.

- Upload

Retrieve data to the local disk at the specified address and size.

Figure 4.4-1. Setting the read data address and size



- Download

According to the settings in the "Download Settings" section, the software executes "Erase Full Chip/Erase Sectors/Do no Erase", "Program ", "Verify", "Option Bytes", and "Run to App".

5 Embed into MDK for use

Open MDK, go to Option for Target 'XXXXXX' settings, switch to Utilities tab and
Select Use External Tool for Flash Programming.
Select the installation location of PY32DfuTool in Command, such as D:\Program Files\PY32DfuTool_x64.exe.
Type #H in Arguments
Click OK, the settings are finished. Then click "LOAD" on the toolbar to download.
Using this method requires MDK software to generate a hex format file.

Figure 5-1. MDK software calls PY32DfuTool software to download Flash

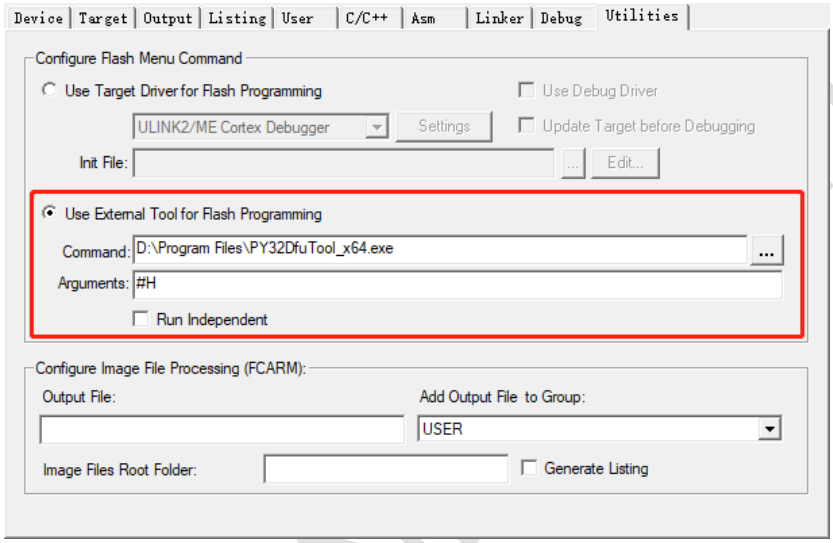


Figure 5-2. MDK software Create HEX File

6 Version History

Versions	Date	Update Record
V1.0	2023.4.2	First Edition

Puya Semiconductor Co., Ltd.