

## Enable FAP function for AT32F413\_403A\_407\_F435\_F437

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### Questions:

How to enable FAP for better encryption function?

### Answer:

It is recommended for users to enable FAP (access protection function). FAP is mainly used in two scenarios below:

- Enable FAP during MCU production and programming
- Enable FAP for terminal product application code

#### Scenario 1: Enable FAP during MCU production and programming

##### Solutions:

Use Artery's AT-Link and ICP for programming, and ICP and AT-Link versions are as follows:

ICP version: V3.0.2 and above (use ICP to automatically upgrade AT-Link firmware)

AT-Link firmware version: V2.0.2 and above

For online programming, tick the "**Enable FAP after download**" box, see below:

The screenshot shows a software window titled "Download Form" with a standard Windows-style title bar (minimize, maximize, close buttons). The window is divided into several sections:

- Extra options**
  - Erase options**: A dropdown menu set to "Erase the sectors of file size".
  - Verify**: A checked checkbox. To its right is a label "Custom encryption key for verify:" followed by an empty text input field.
  - Disable FAP before download**: An unchecked checkbox.
  - Enable FAP after download**: A checked checkbox, highlighted with a red rectangular border.
  - Access protection**: A dropdown menu.
  - Jump to the user program**: An unchecked checkbox.
  - Write user system data**: An unchecked checkbox.
  - Button free mode**: An unchecked checkbox.
  - User system data file path**: A text input field with a browse button ("...") to its right.
- sLib settings** (with a sub-tab for "Software serial number(SN)")
  - sLib status**: Displayed as "Disable".
  - Enable sLib**: An unchecked checkbox.
  - sLib enable password**: Labeled "0x" followed by an empty text input field.
  - Disable sLib before download**: An unchecked checkbox.
  - sLib disable password**: Labeled "0x" followed by an empty text input field.
  - Disable sLib**: A button.
  - sLib position**: A dropdown menu set to "Main Flash".
  - Start sector**: A dropdown menu set to "Sector0--0x08000000".
  - INSTR start sector**: A dropdown menu set to "Sector0--0x08000000".
  - End sector**: A dropdown menu set to "Sector0--0x08000000".

At the bottom of the window, there are three buttons: "Start Download", "Cancel Download", and "Close".

For offline programming, tick the “**Enable FAP after download**” box, and select SWD interface, see below:

The screenshot shows the 'AT-Link Setting' window with the following configuration:

- Offline project: [Empty dropdown] [Delete] [Creat]
- Project name: [Empty text box] Device: AT32F407 [Dropdown] Universal [Dropdown]
- Table with columns: No., File name, File size, Address range(0x), Storage location. [Add] [Delete] buttons are on the right.
- Erase option: Erase the sectors of file size [Dropdown]
- Download times [Text box]  Verify
- Encryption transmit
- Reset and run Download interface: **SWD** [Dropdown]
- Write user system data [Text box] [.....]
- Enable FAP after download**
- Software serial number(SN) | SPIM settings | sLib settings | Bluetooth module Mac setting
- Write software serial number
- Write address in flash: 0x [08010000]
- Initial SN: 0x [00000001]
- Increase step: 0x [00000001]
- [Load parameters] [Save parameters]
- [Open project file] [Save project file] [Save project to AT-Link] [Close]

**Scenario 2: Enable FAP for terminal product application code****Solution:**

Add the following judgement and FAP enable sentence in the application code.

BSP versions for calling FAP functions are as follows:

AT32F413\_Firmware\_Library\_V2.0.6 and above versions

AT32F403A\_407\_Firmware\_Library\_V2.1.1 and above versions

AT32F435\_437\_Firmware\_Library\_V2.0.9 and above versions

```
if(USD->fap != 0xFFFF)
{
    flash_unlock();
    flash_fap_enable(TRUE);
    NVIC_SystemReset();
}
```

**Type:** MCU application

**Applicable products:** AT32F413, AT32F403A/407, AT32F435/437

**Main function:** FAP (access protection enabled)

**Other function:** None

## Document revision history

Date	Revision	Changes
2022.6.28	2.0.0	Initial release

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