# M031多應用程式跳轉

NuMicro® 32 位系列微控制器範例代碼介紹

## 文件資訊

| | |
|---|---|
| 應用簡述 | 此範例是 M031 通過 IAP 方式跳轉到所需執行的應用 |
| BSP 版本 | M031 BSP CMSIS V3.03.000 |
| 開發平台 | NuMaker-M031SD V1.1 |

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# 1 概述

此範例有3個M031應用程式，通過IAP方式，更改中斷向量表位址，和MCU系統復位，跳轉到所需的執行應用。

## 1.1 原理

此範例包含3個應用程式:

- 應用程式 MultiLD 為放置在 LDROM 區功能代碼，開始位址為 0x100000；
- 應用程式 MultiAP1 為放置在 APROM 區功能代碼，開始位址為 0；
- 應用程式 MultiAP2 為放置在 APROM 區功能代碼，開始位址為 0x4000。

晶片配置為：

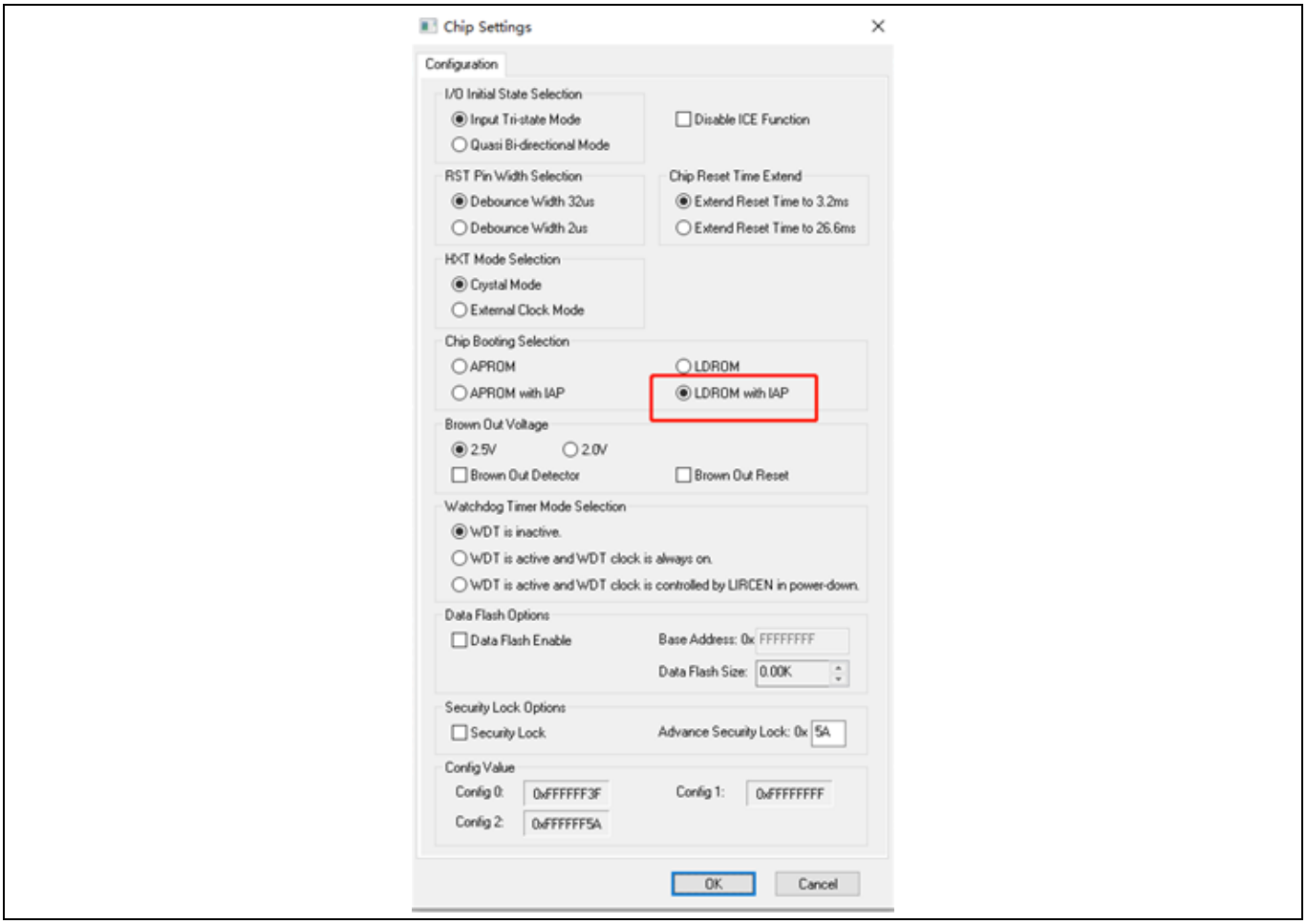


圖 1-1 晶片配置

MultiLD Keil工程配置：

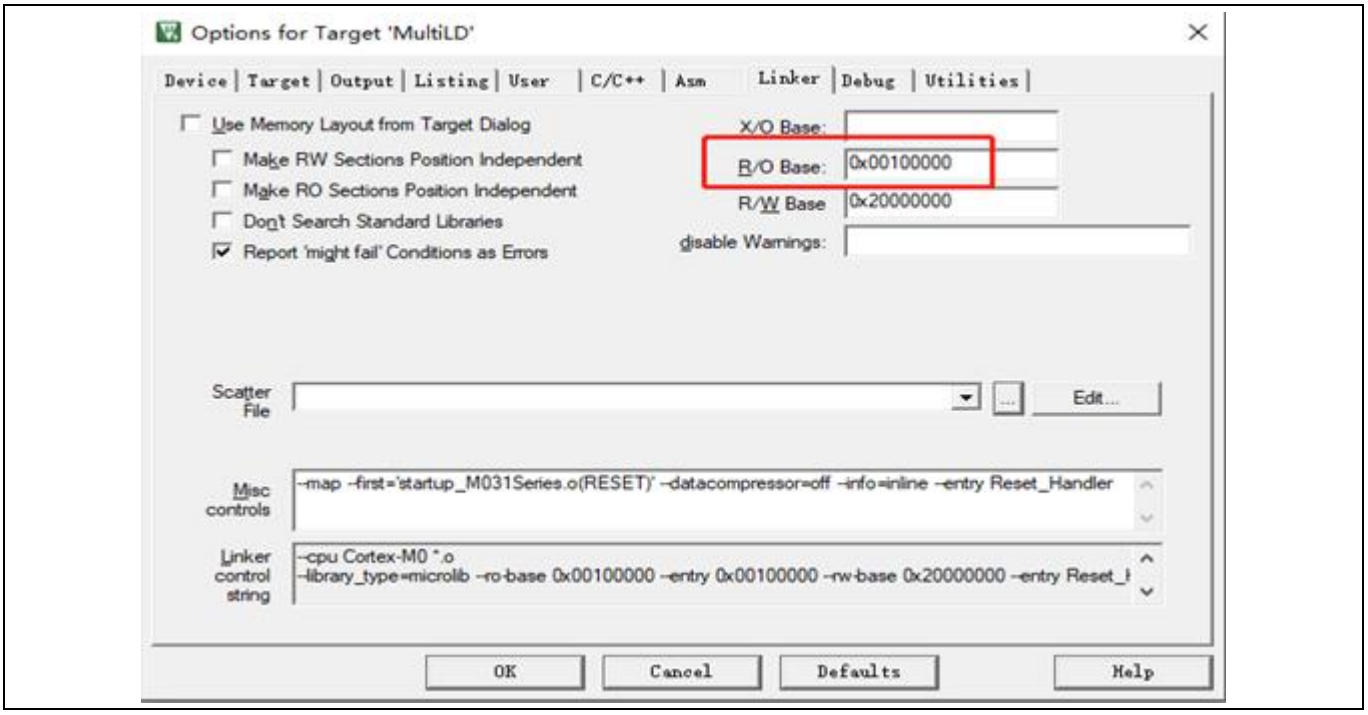


圖 1-2 MultiLD Keil 工程配置

MultiAP1 Keil工程配置：

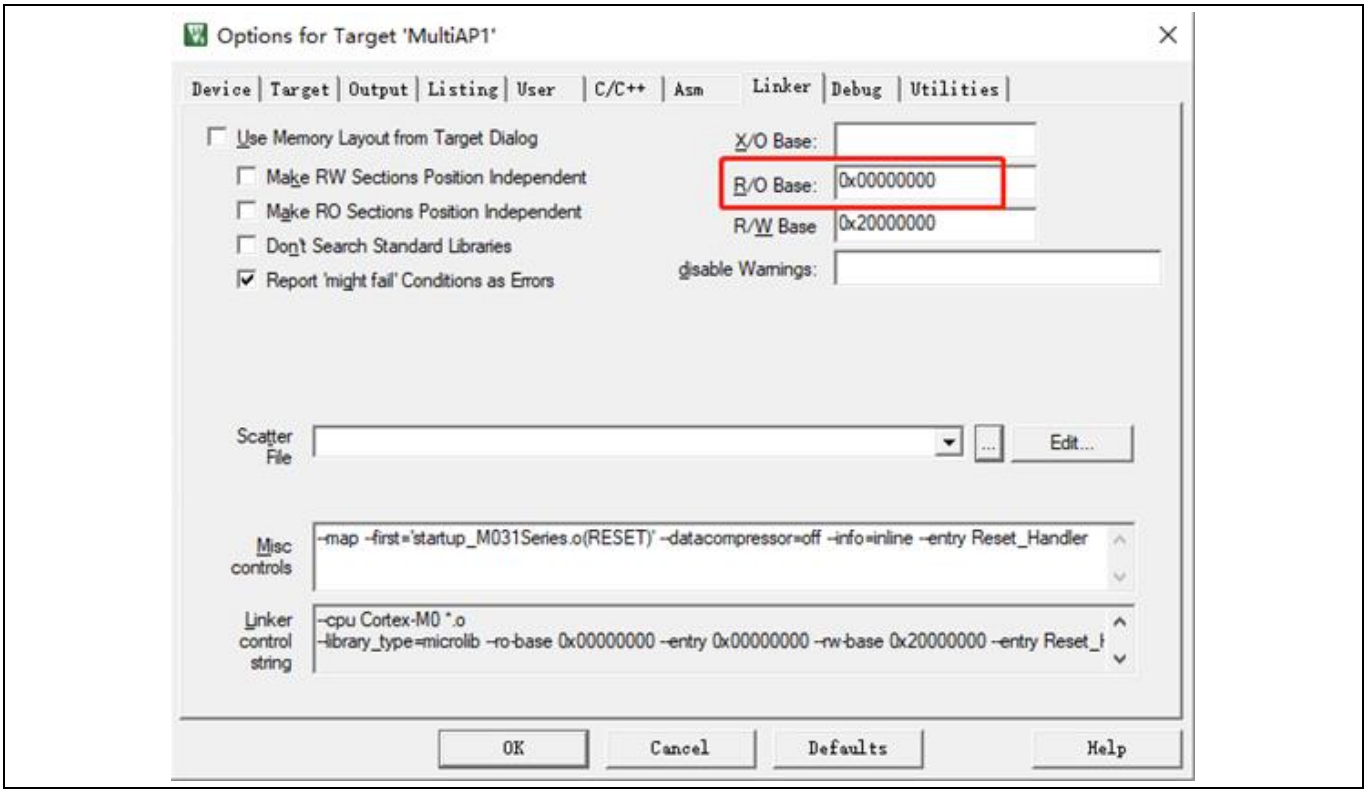


圖 1-3 MultiAP1 Keil 工程配置

MultiAP2 Keil工程配置：

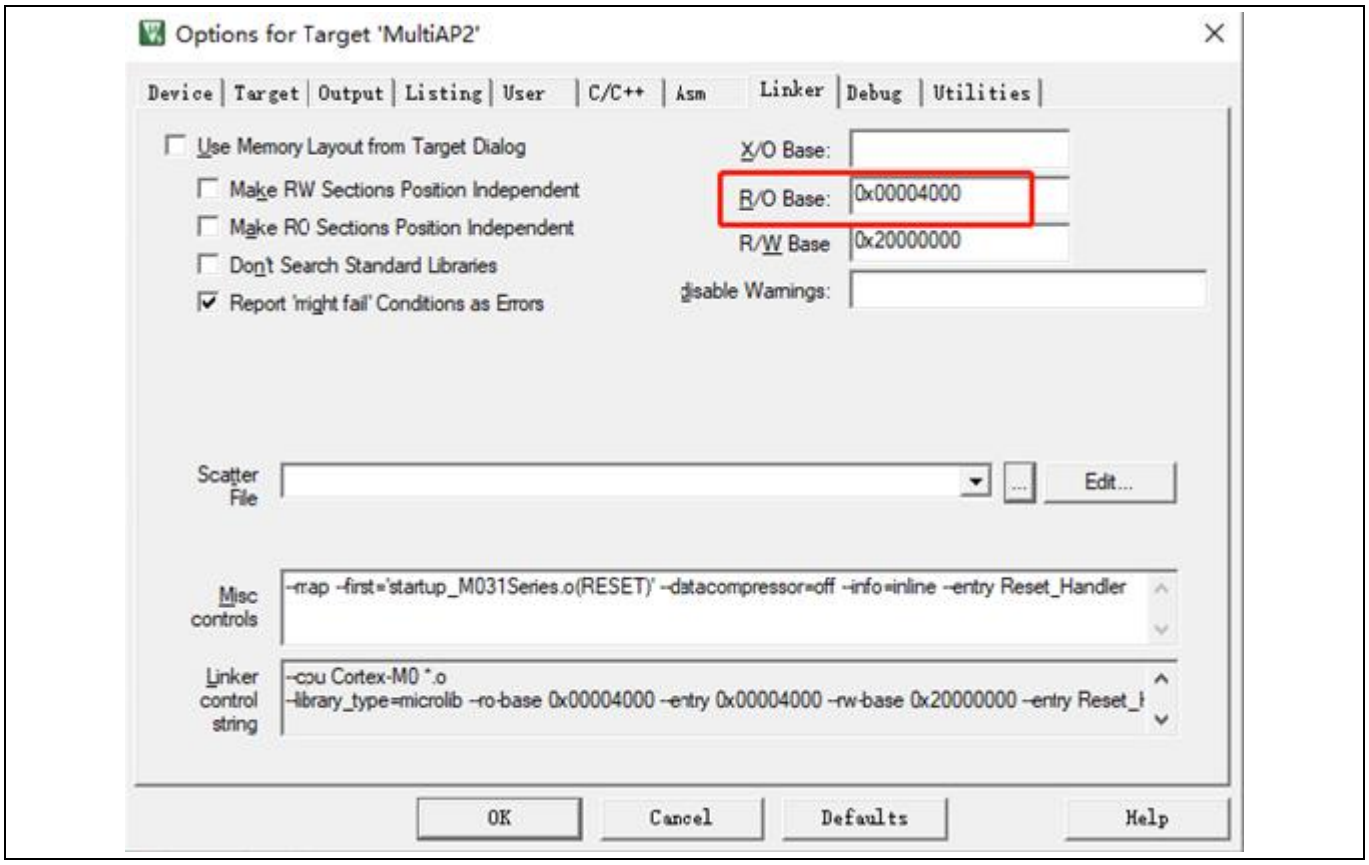


圖 1-4 MultiAP2 Keil 工程配置

## 1.2 ICP 下載程序

連接ICP工具，下載應用程式到芯片內。同時下載MultiAP1.bin，MultiLD.bin和Chip CONFIG配置，如下圖1-5和圖1-6：

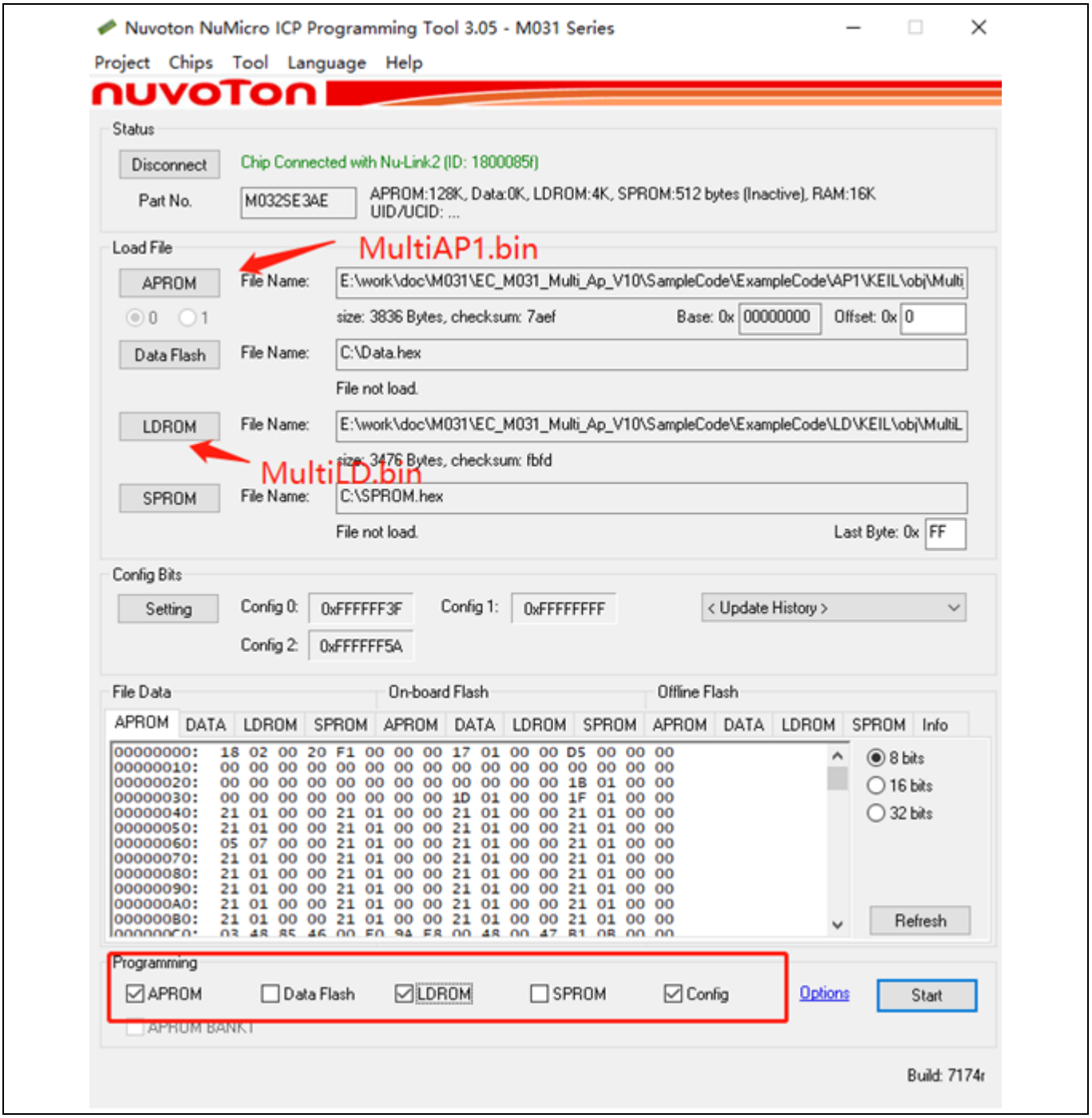


圖 1-5 ICP 配置（MultiAP1.bin 和 MultiLD.bin 下載）

再連接ICP工具，同樣方式下載應用程式MultiAP2.bin，注意此程式燒寫的偏移位址是0x4000。

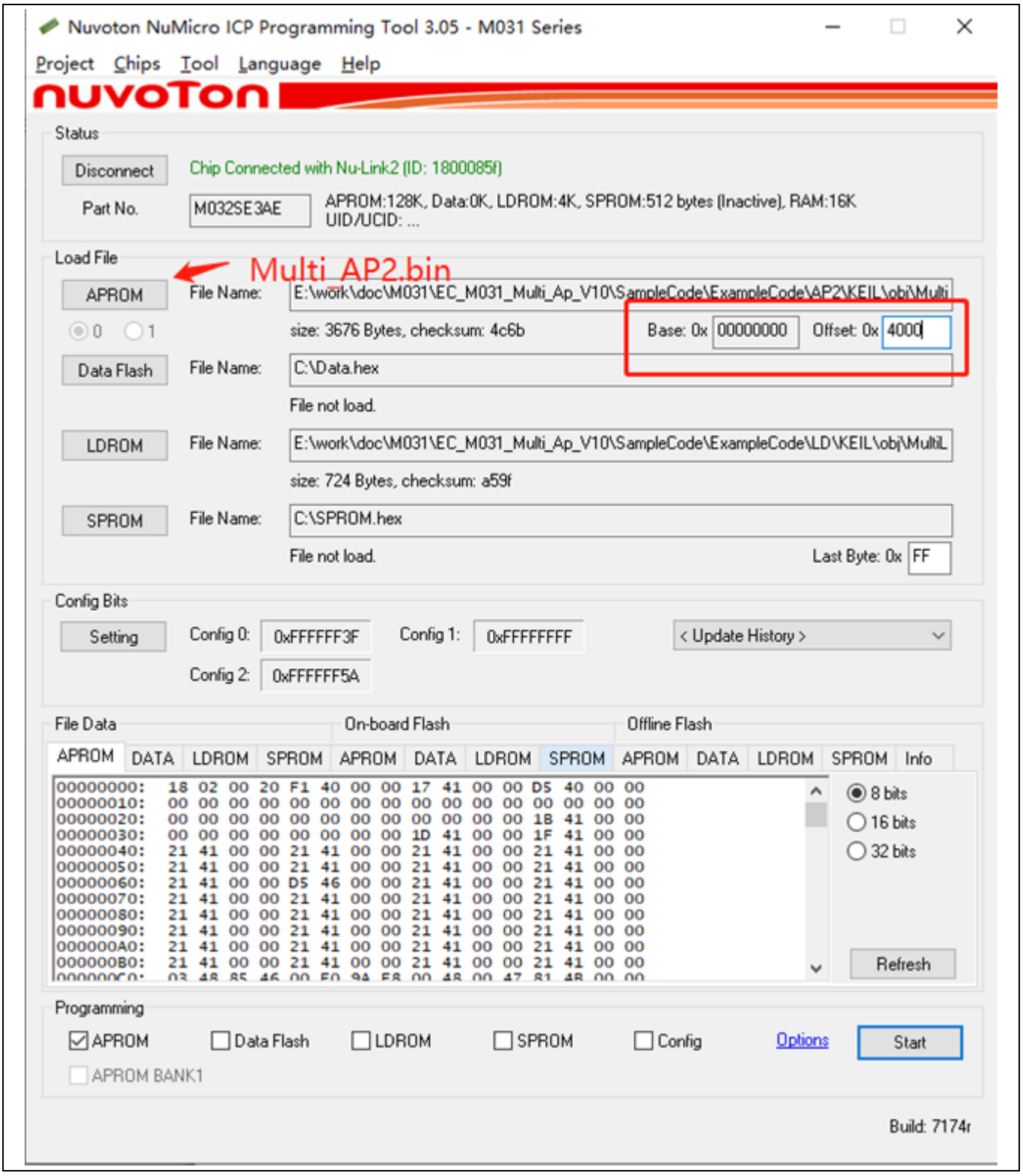


圖 1-6 ICP 配置（MultiAP2.bin 下載）

## 1.3 執行結果

通過串口，連接電腦上串口工具，並根據提示，輸入相應字符，運行結果如下圖1-7：

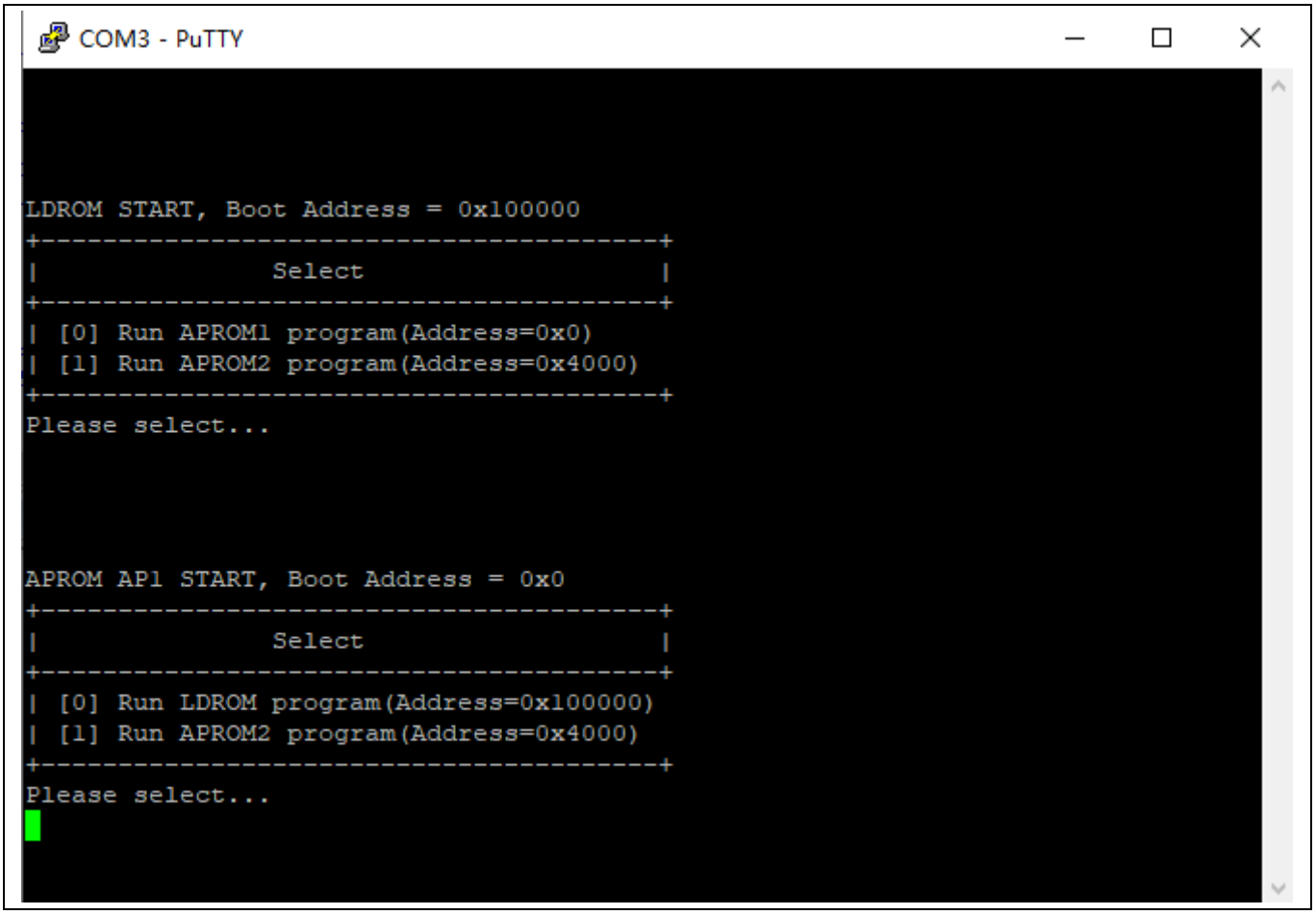


圖 1-7 執行結果

# 2 代碼介紹

設置中斷向量地址及 mcu 系統復位：

```
#define AP1_BASE_ADDRESS 0
#define AP2_BASE_ADDRESS 0x4000
#define LD_BASE_ADDRESS 0x100000
SYS_UnlockReg();
/* Enable FMC ISP function */
FMC_Open();
/*Disable all interrupts*/
NVIC->ICER[0] = 0xFFFFFFFF;

FMC_SetVectorPageAddr(AP2_BASE_ADDRESS);
/* Reset CPU only to reset to new vector page */
// SYS_ResetCPU();
/* Reset System to reset to new vector page. */
NVIC_SystemReset();
```

# 3 軟體與硬體需求

- **軟體需求**
  - BSP 版本
    - M031_Series_BSP_CMSIS_V3.03.000
  - IDE 版本
    - Keil uVersion 5.26
- **硬體需求**
  - 電路元件
    - NuMaker-M031SD V1.1

# 4 目錄資訊

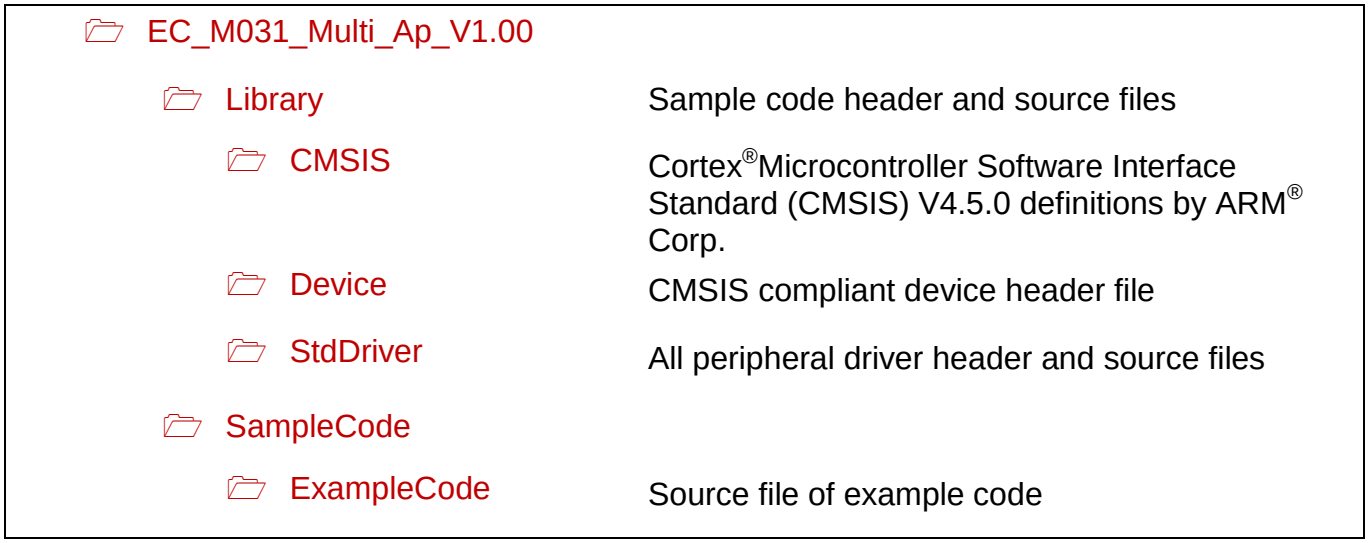


圖 4-1 目錄資訊

# 5 範例程式執行

1. 通過 ICP 工具連接晶片，進入 Config Bits->Setting 配置，更改 Chip booting selection 為 LDROM with IAP。
2. 編譯代碼，連接 ICP 工具進入下載模式
   - 分別打開 MultiLD，MultiAP1，MultiAP2 工程進行完整編譯
   - 連接 ICP 工具，並下載代碼
   - MultiLD 代碼下載於 LDROM
   - MultiAP1 代碼下載於 APROM，偏移位址為 0
   - MultiAP2 代碼下載於 APROM，偏移位址為 0x4000
   - 進行下載。
3. 重新上電復位 mcu
   - 執行代碼
   - 通過串口輸入提示字元即可跳轉到所需應用。

# 6 修訂紀錄

| Date | Revision | Description |
|---|---|---|
| 2021.05.25 | 1.00 | 1. 初始發布. |

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