M031 Multi-Application Jump

Example Code Introduction for 32-bit NuMicro® Family

Information

Application	This example code uses M031 to achieve multi-application jump through the IAP way.
BSP Version	M031 BSP CMSIS V3.03.000
Hardware	NuMaker-M031SD V1.1

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1 Overview

This example code uses three M031 applications, through the IAP way, to change the interrupt Vector table address, reset the MCU system, and jump to the required execution of the application.

1.1 Principle

This example code includes three applications:

- MultiLD is placed in the LDROM region, and the starting address is 0x100000.
- MultiAP1 is placed in the APROM region, and the starting address is 0.
- MultiAP2 is placed in the APROM region, and the starting address is 0x4000.

Configuration of chip:

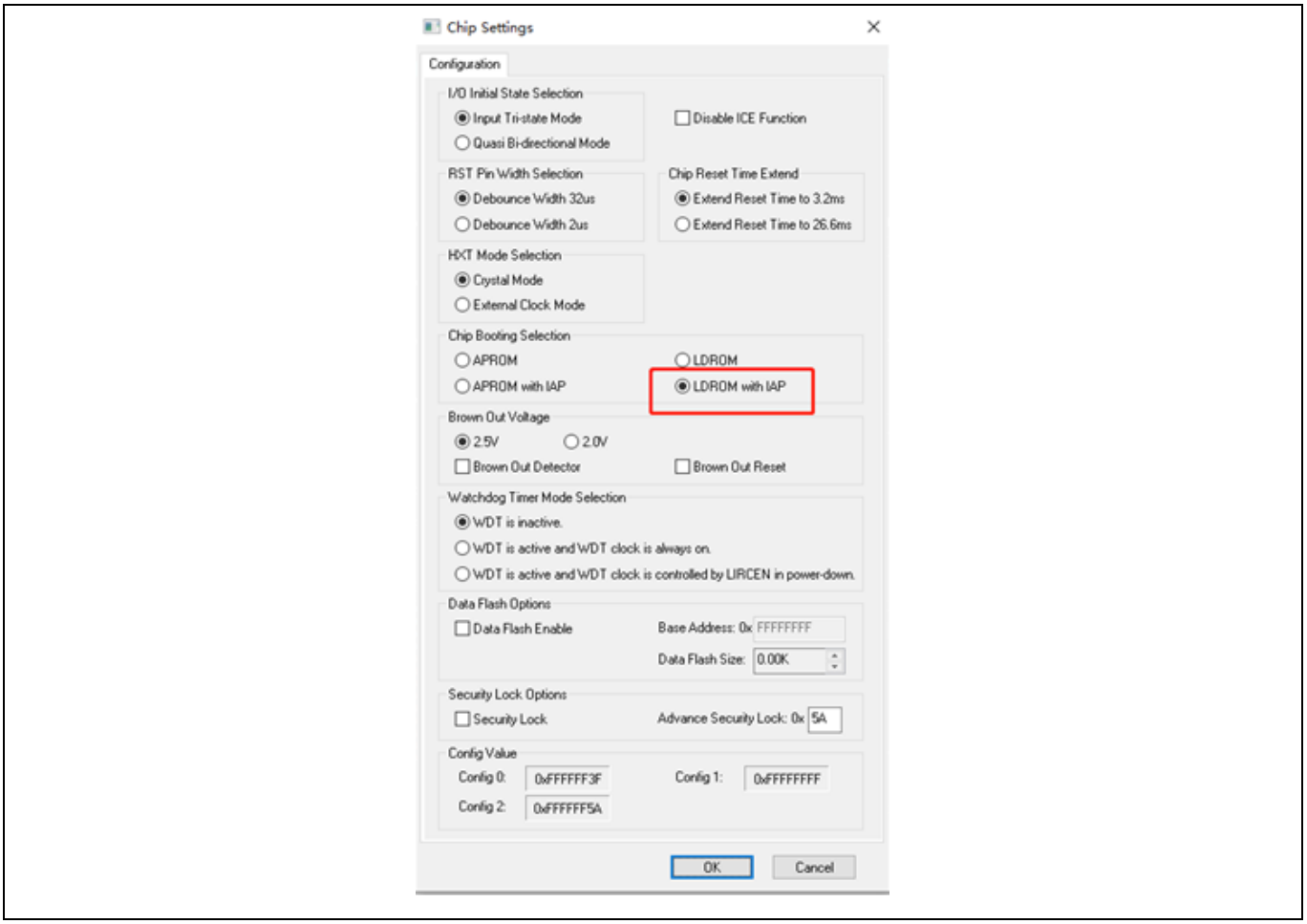

Figure 1-1 Configuration of Chip

MultiLD Keil project configuration:

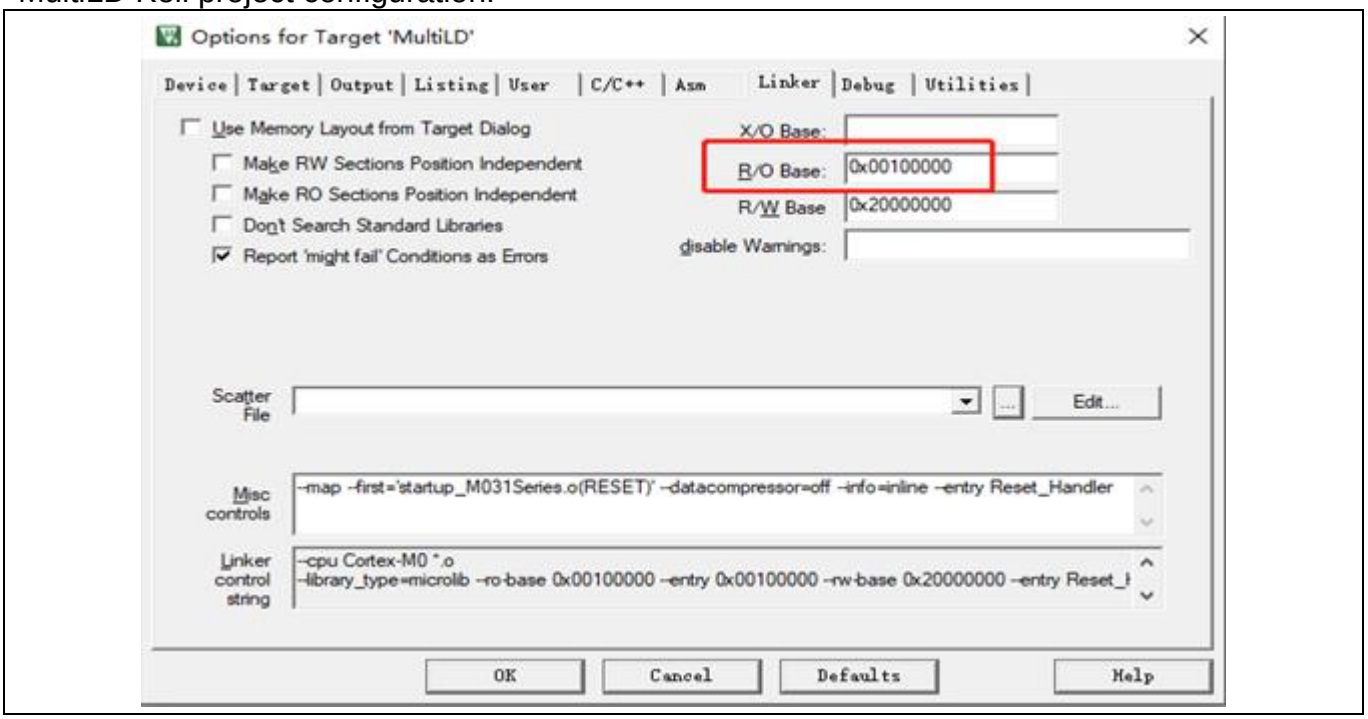

Figure 1-2 MultiLD Keil Project Configuration

MultiAP1 Keil project configuration:

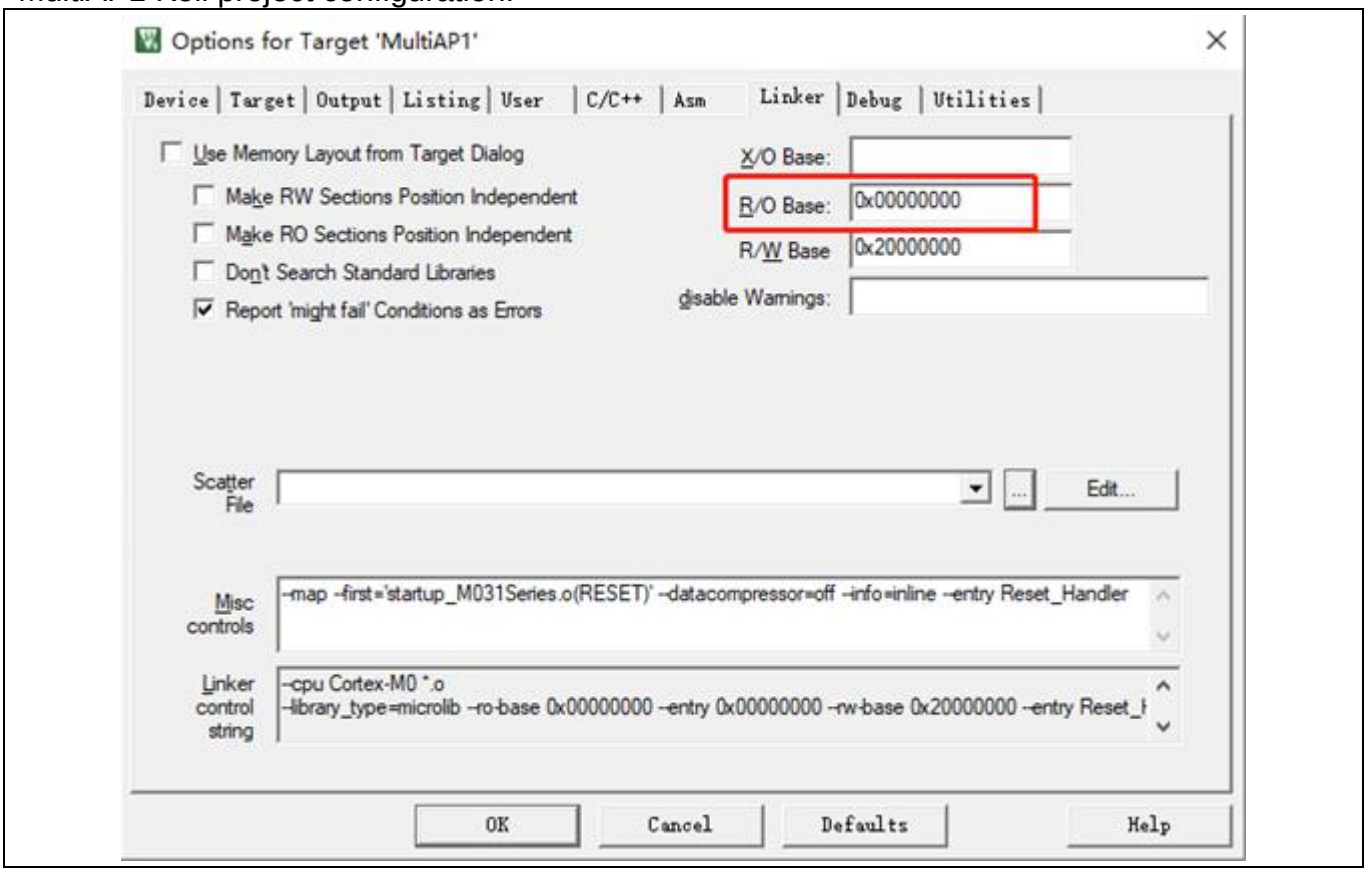

Figure 1-3 MultiAP1 Keil Project Configuration

MultiAP2 Keil project configuration:

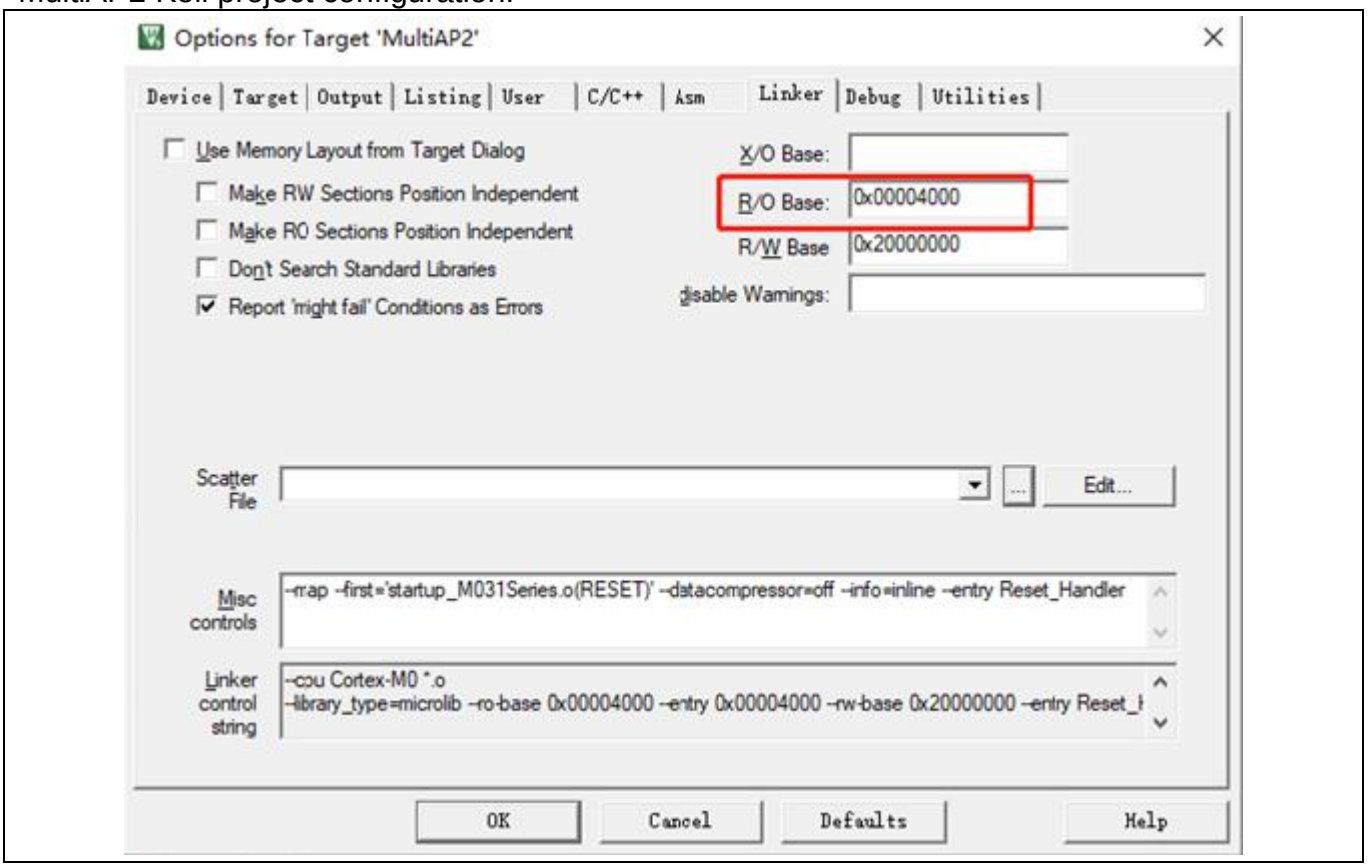

Figure 1-4 MultiAP2 Keil Project Configuration

1.2 ICP Download

Connect to the ICP tool and download the applications to the chip. Download *MultiAP1.bin*, *MultiLD.bin* and chip configuration is shown in Figure 1-5 and Figure 1-6.

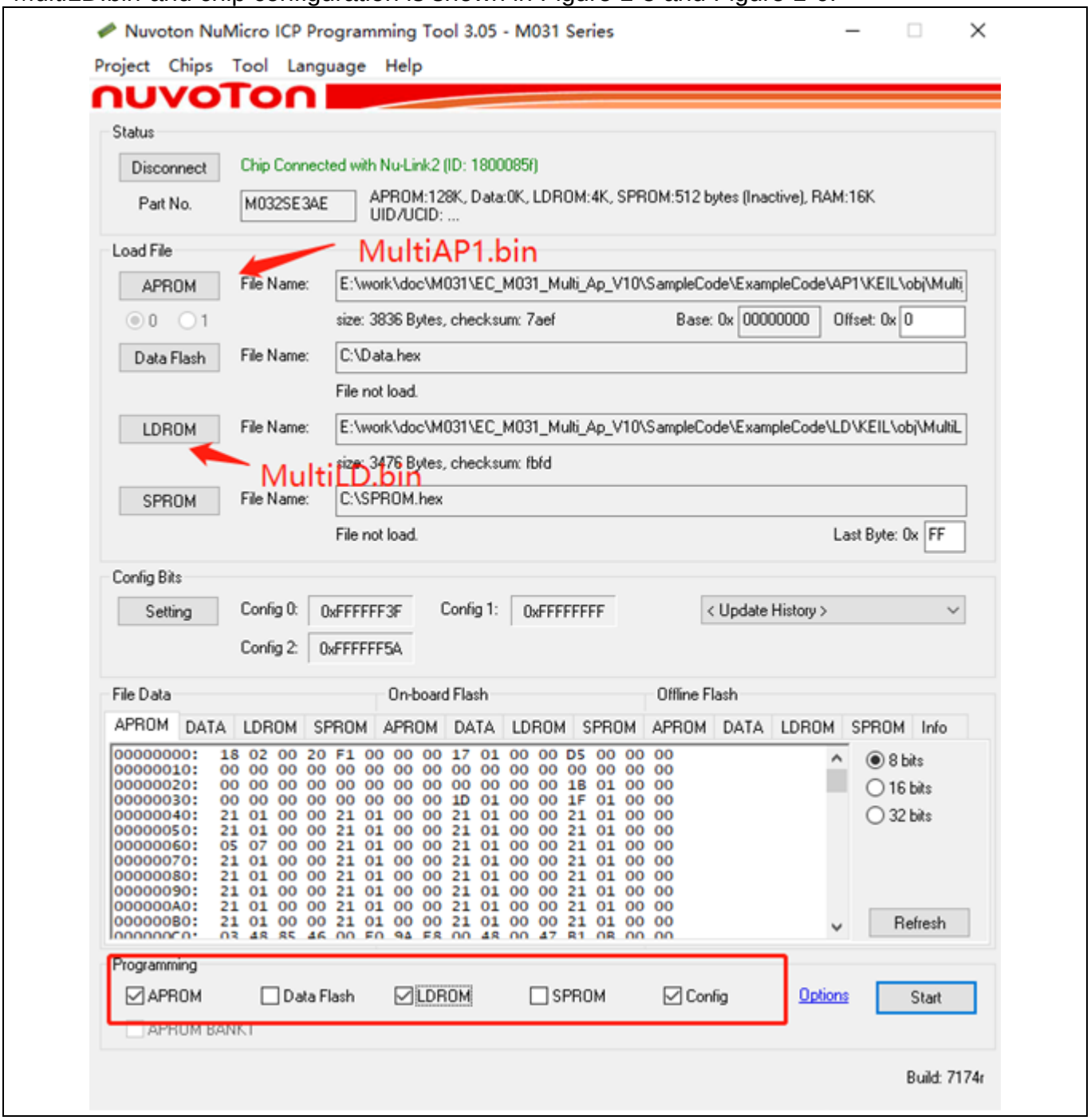

Figure 1-5 ICP Configuration(*MultiAP1.bin* and *MultiLD.bin Download*)

Then connect to the ICP tool and download the application *MultiAP2.bin* in the same way. Note that the program's offset address is 0x4000.

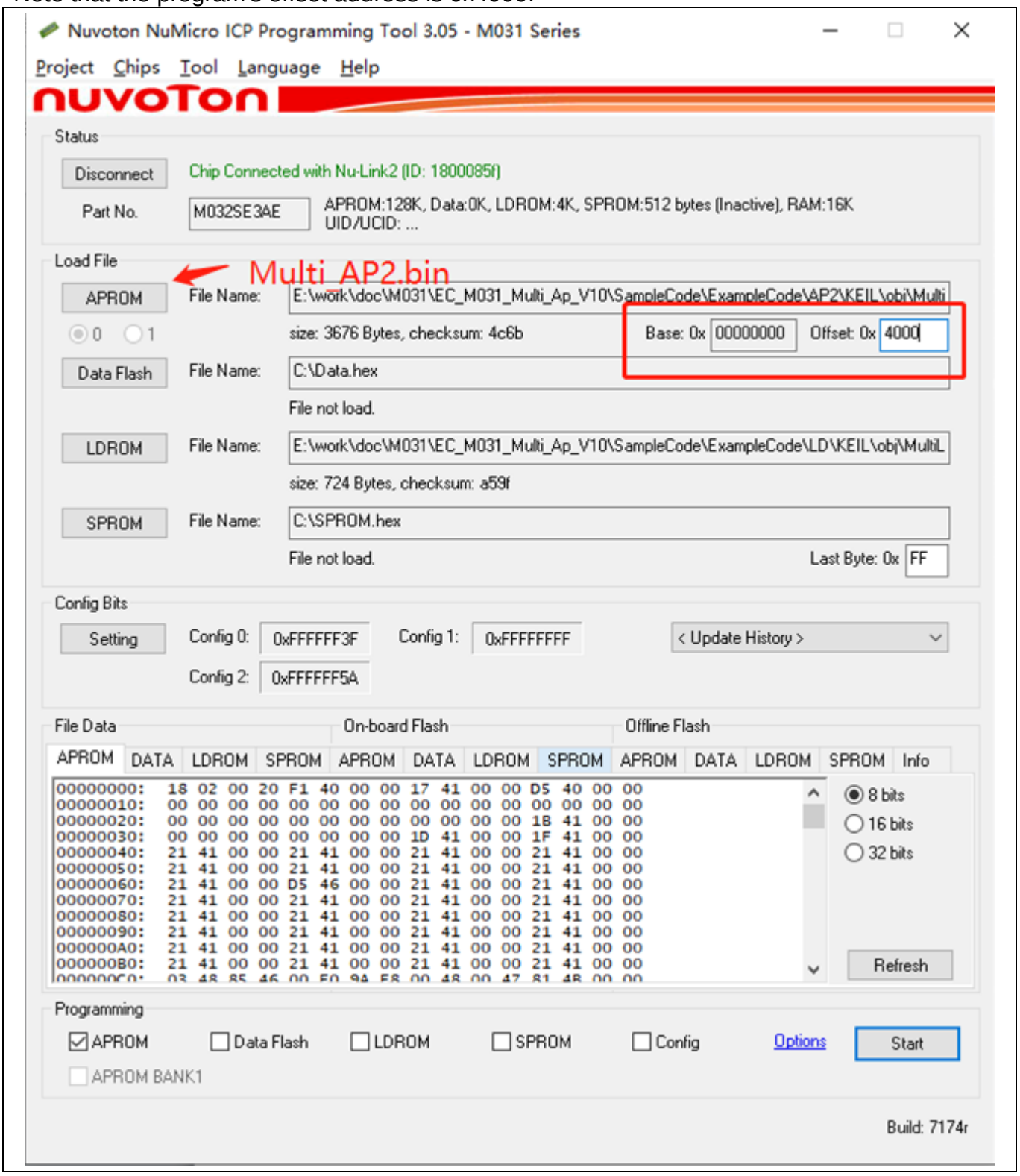

Figure 1-6 ICP Configuration(*MultiAP2.bin Download*)

1.3 Demo Result

Through UART, connect to the serial port tool of the computer, and input the corresponding characters according to the prompts. The results are as Figure 1-7.

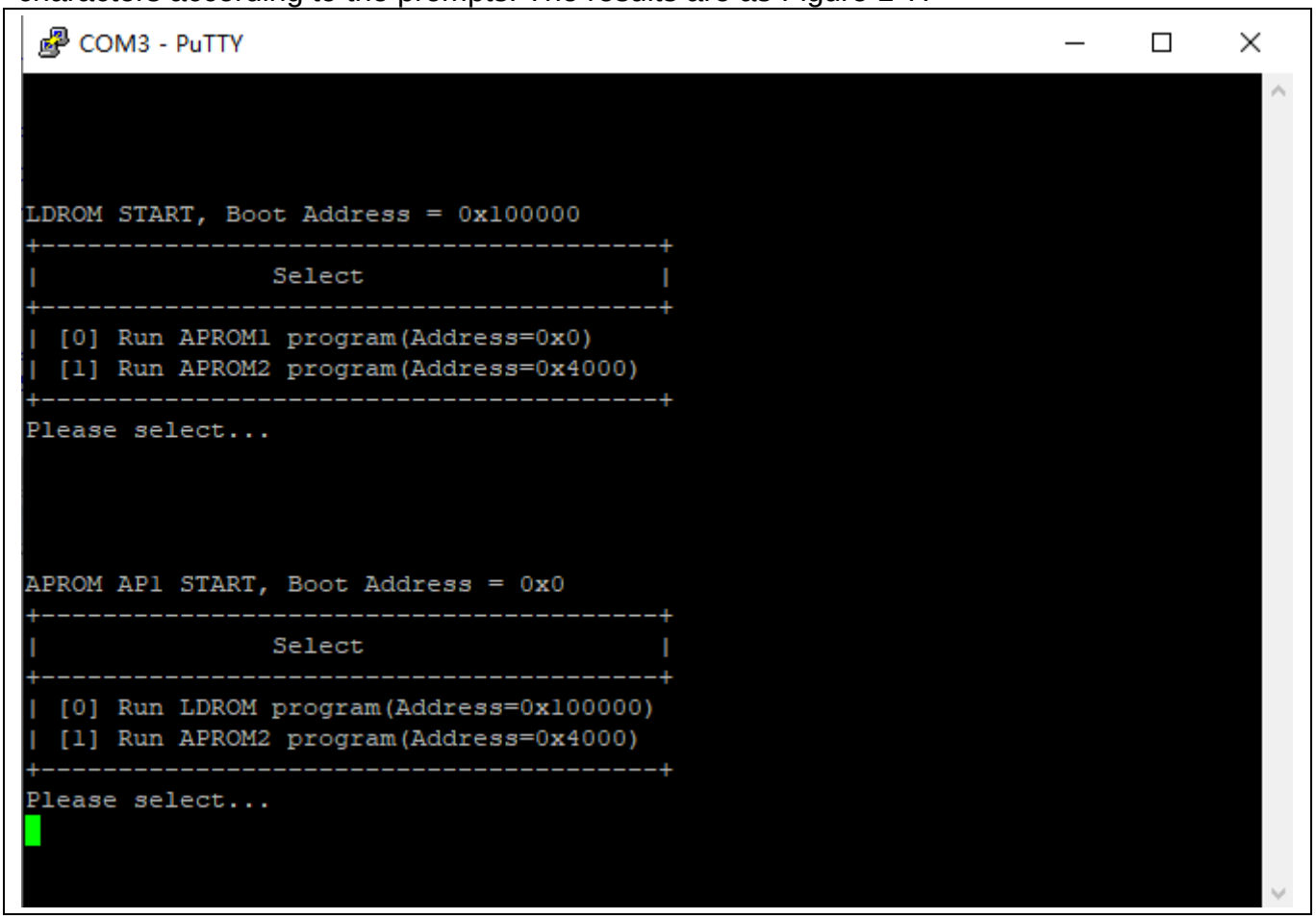

Figure 1-7 Demo Result

2 Code Description

Set interrupt vector address and MCU system reset.

```
#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 Software and Hardware Requirements

3.1 Software Requirements

- BSP version
  - M031_Series_BSP_CMSIS_V3.03.000
- IDE version
  - Keil uVersion 5.26

3.2 Hardware Requirements

- Circuit components
  - NuMaker-M031SD V1.1

4 Directory Information

The directory structure is shown below.

EC_M031_Multi_Ap_V1.00	
Library	Sample code header and source files
CMSIS	Cortex® Microcontroller Software Interface Standard (CMSIS) by Arm® Corp.
Device	CMSIS compliant device header file
StdDriver	All peripheral driver header and source files
SampleCode	
ExampleCode	Source file of example code

Figure 4-1 Directory Information

5 Example Code Execution

1. Connect the chip through the ICP tool, enter the **Config Bits** -> **Setting**, and change the Chip Booting Selection to LDROM with IAP.
2. Compile, connect the ICP tool and enter the download mode.
   - Open MultiLD, MultiAP1 and MultiAP2 projects respectively and complete compilation.
   - Connect the ICP tool, and download code.
   - MultiLD is placed in the LDROM region, and the starting address is 0x100000.
   - MultiAP1 is placed in the APROM region, and the starting address is 0.
   - MultiAP2 is placed in the APROM region, and the starting address is 0x4000.
   - Download.
3. Restart and reset MCU.
   - Execute code.
   - Input prompt characters through the Uart0 to jump to the desired application.

6 Revision History

Date	Revision	Description
2021.05.25	1.00	1. Initially issued.

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