

FMC

Dual Bank

Presenter

www.nuvoton.com

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Dual Bank sample code

- **The firmware update doesn't need to stop program execution**
- **Boot from LDROM to check where the newest firmware in**
 - If APROM Bank0 has the newest firmware, jump to APROM bank0 and execute.
 - If APROM Bank1 has the newest firmware.
 - ◆ Copy it to APROM bank0.
 - ◆ Jump to APROM bank0 and execute.

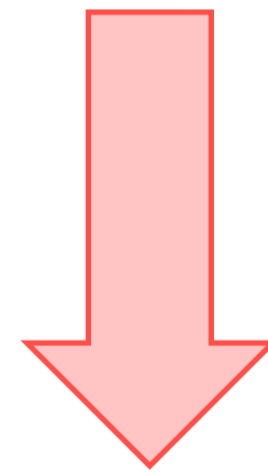
Dual Bank sample code

- **Firmware will be executing in APROM Bank 0**
- **User can use ISP tool to update Firmware by USB 1.1**
- **The updated Firmware will be store at APROM bank1**
- **M480 will be boot from LDRROM after reset.**
- **The firmware in LDRROM will update the newest Firmware from APROM bank1 to APROM bank0 and executing APROM bank0 firmware.**

Dual Bank sample code

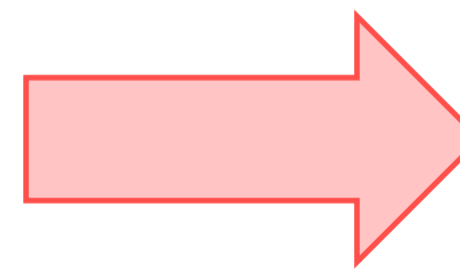
- Normal operating flow

Boot From LDROM



LDROM

Jump to APROM

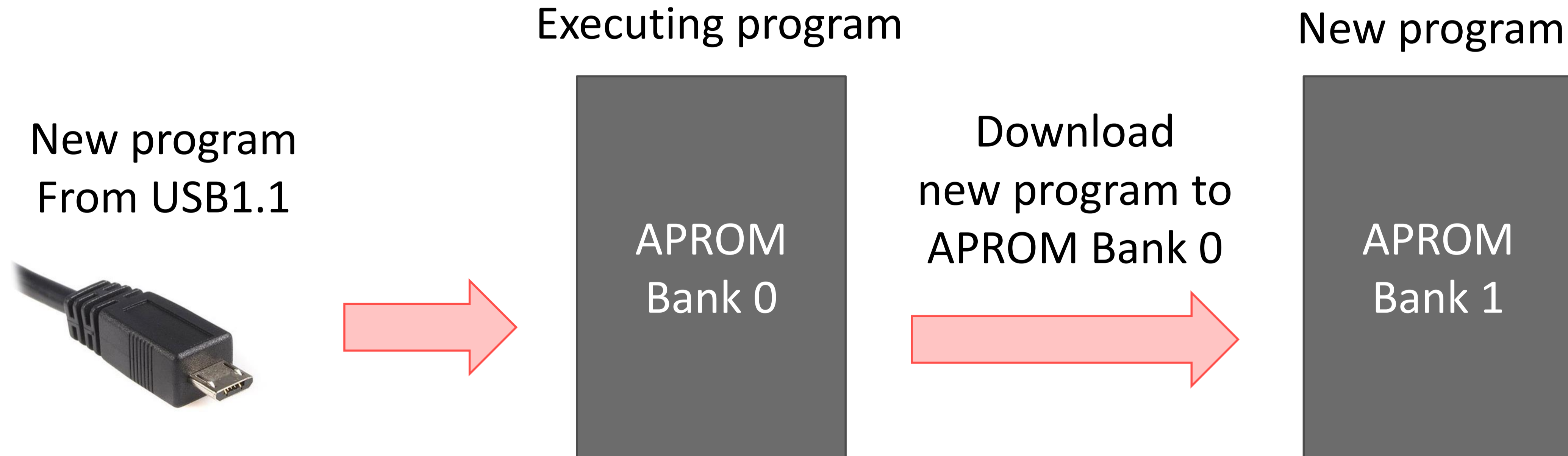


Executing program

APROM
Bank 0

Dual Bank sample code

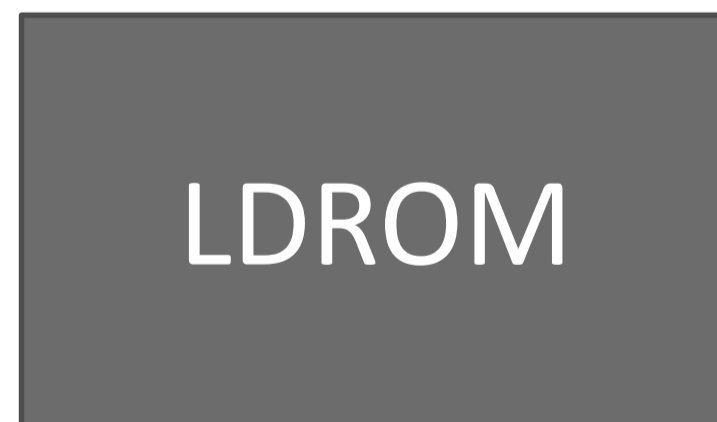
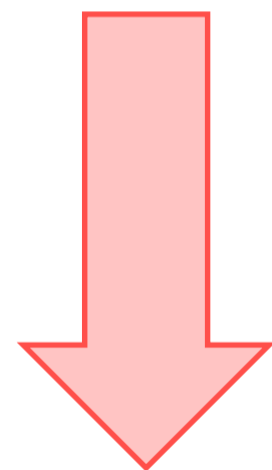
- Update firmware



Dual Bank sample code

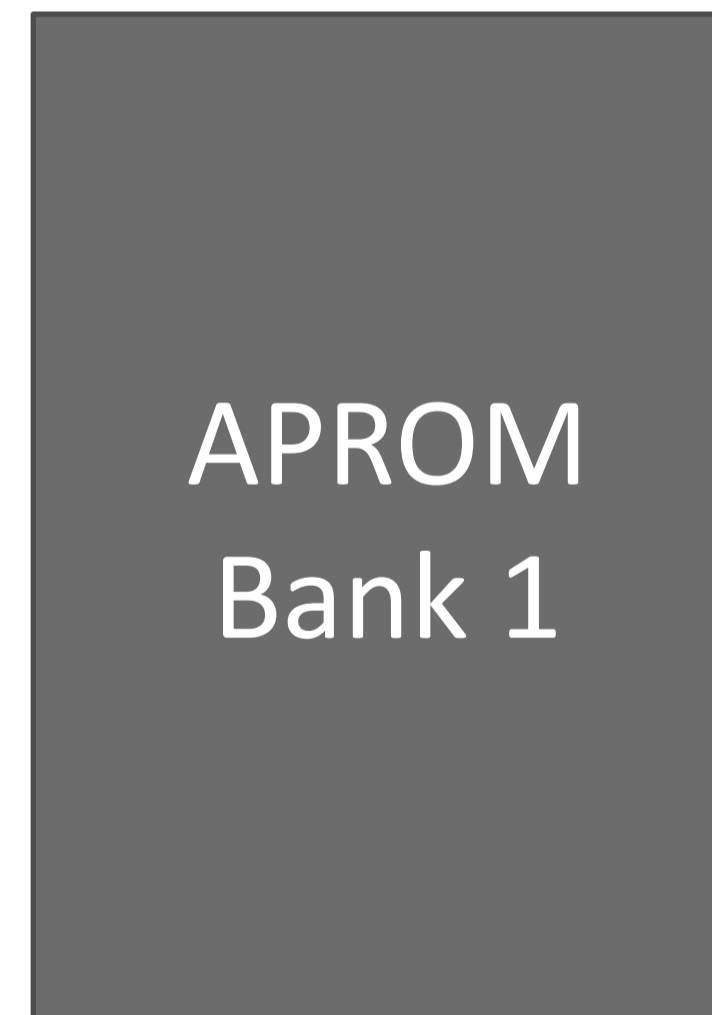
- **Reset M480 to update firmware**

Boot From LDROM

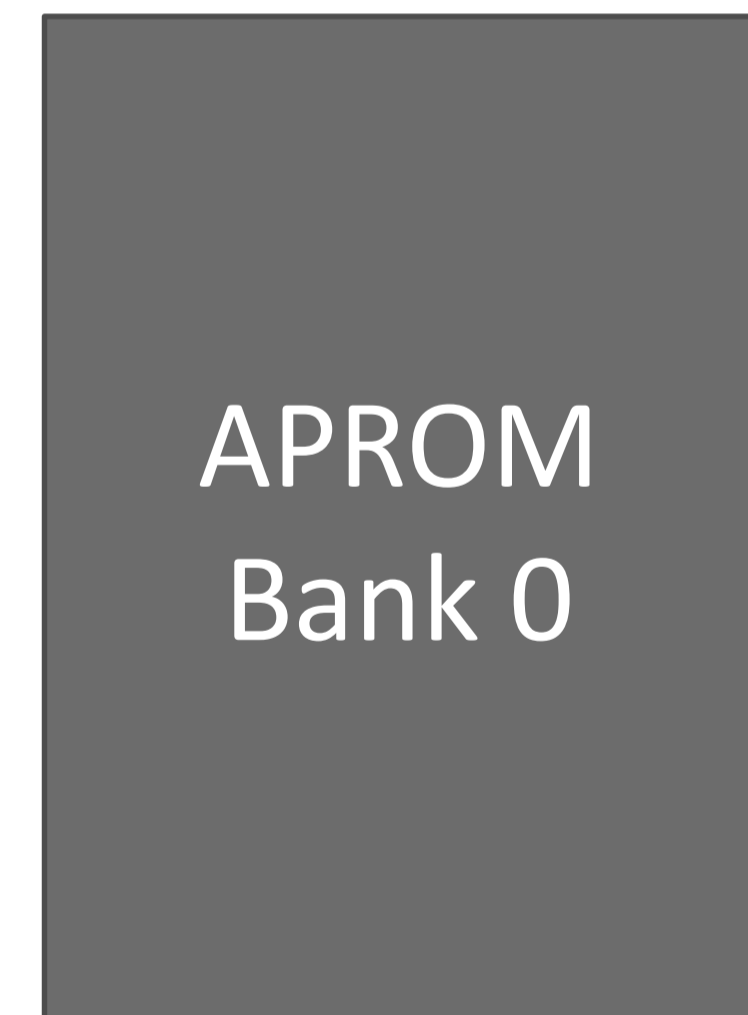


Check last
Firmware

New Firmware

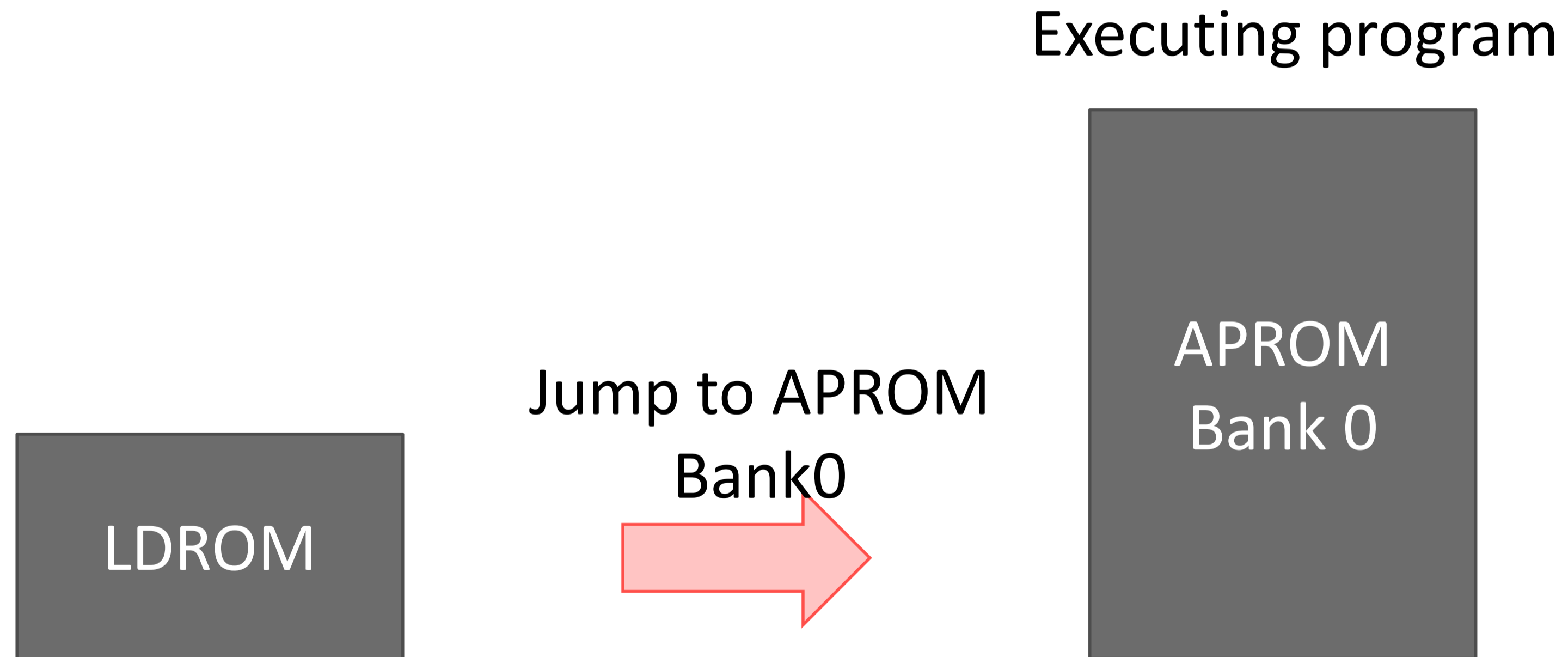


Copy



Dual Bank sample code

- After updated



DUAL BANK SAMPLE CODE

For IAR compiler

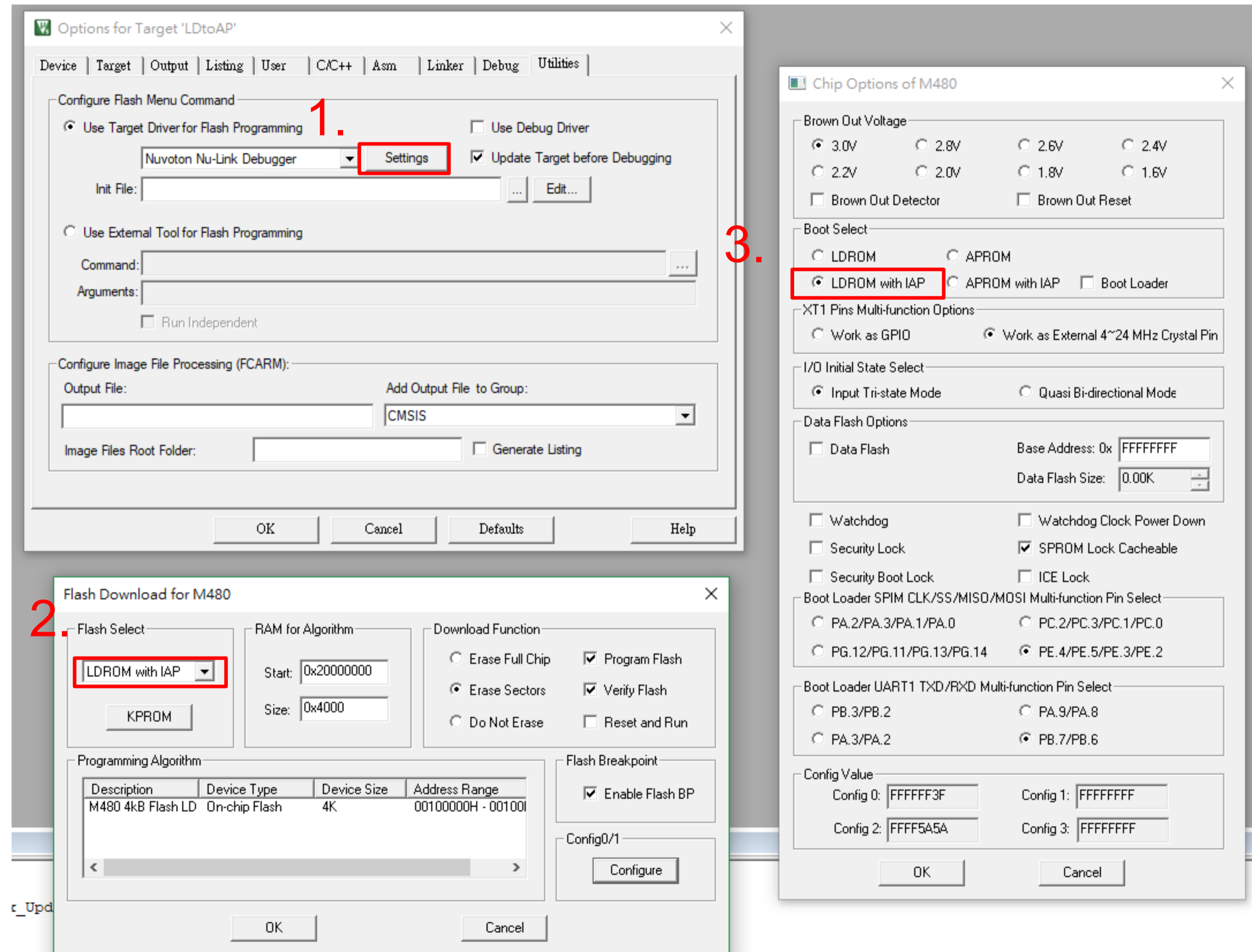
Dual Bank sample code

- 1. Load LDRROM file**
- 2. Load APROM file**
- 3. Check Version: 0x64**
- 4. Load new APROM file by ISP tool**
- 5. Check Version: 0x65**

Load LDROM File

- Open LDtoAP sample code

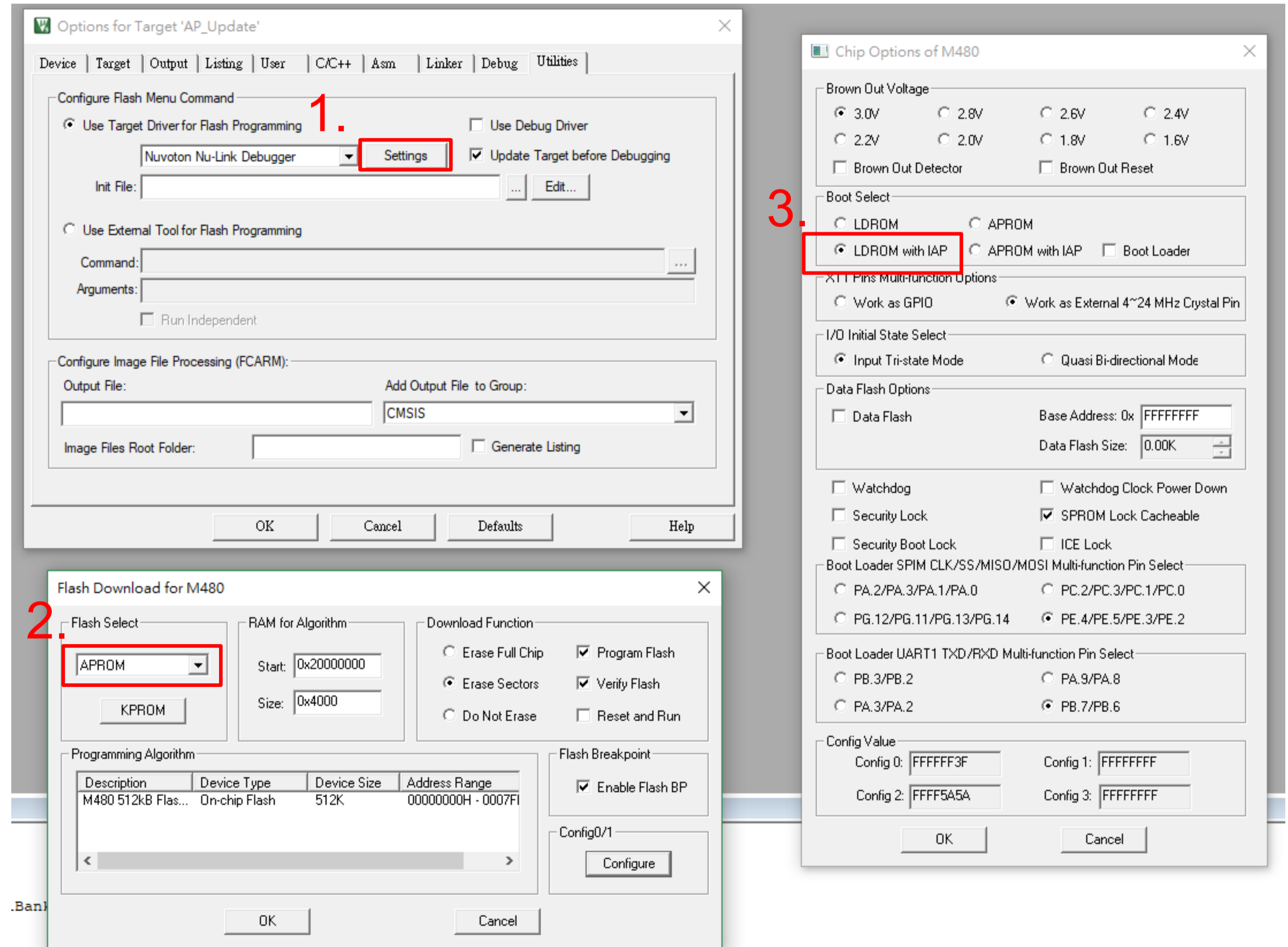
1. Setting options for target
2. Flash: LDROM with IAP
3. Boot: LDROM with IAP
4. Download code



Load APROM File

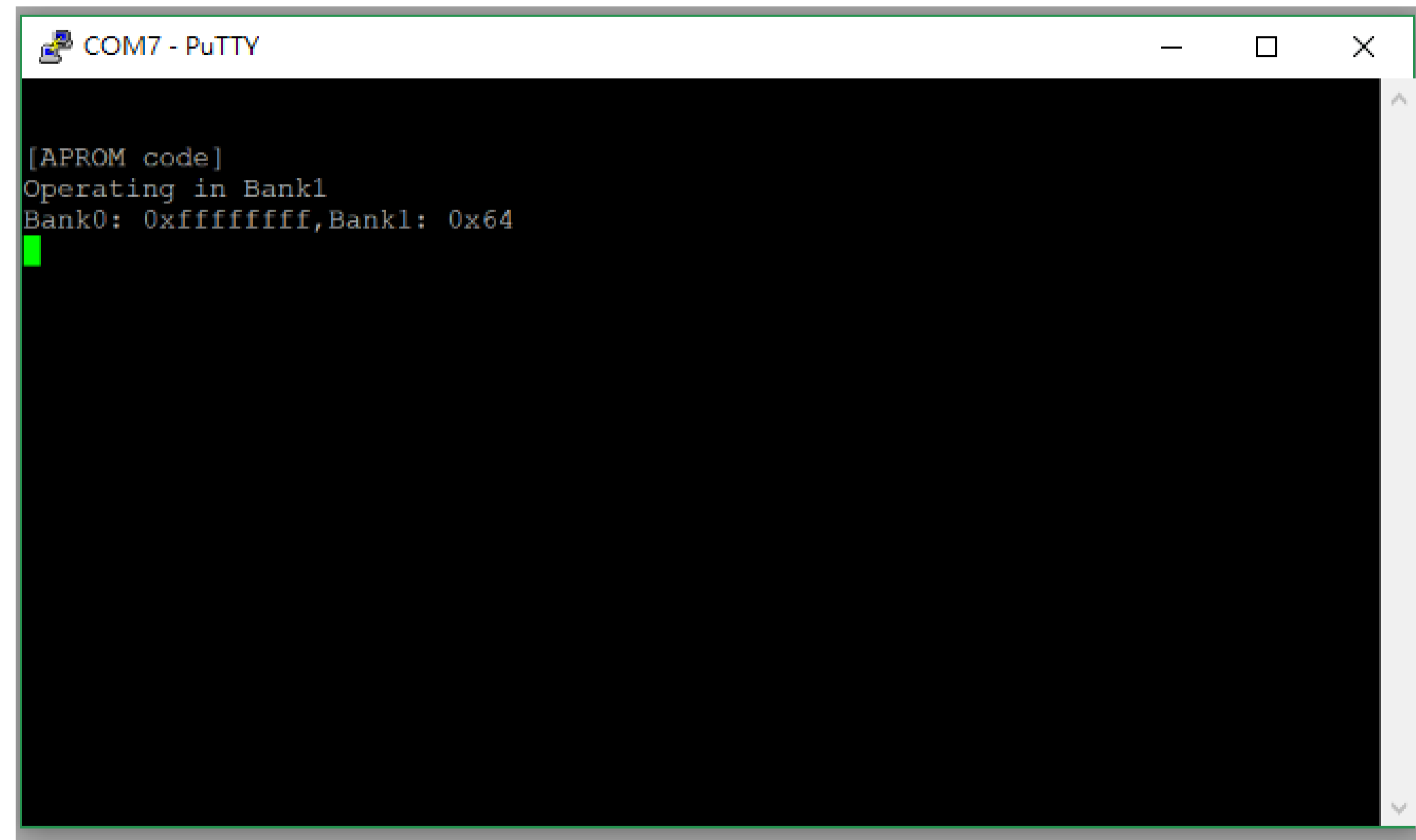
- Open AP_Update sample code

1. Setting options for target
2. Flash: APROM
3. Boot: LDRROM with IAP
4. Download code



Check Version

- **Open Putty and reset M480**
 - File version should be 0x64

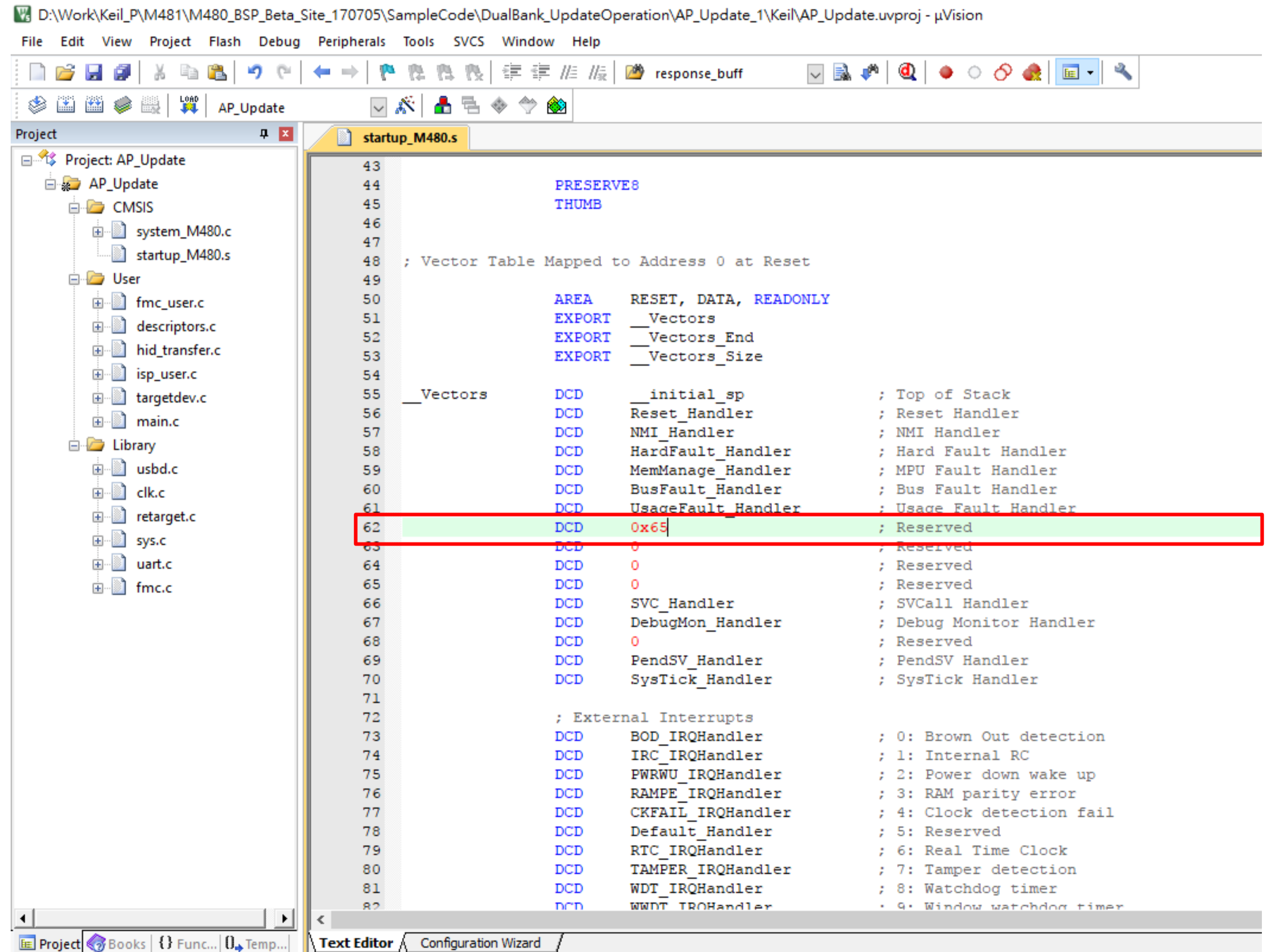


```
COM7 - PuTTY
[APROM code]
Operating in Bank1
Bank0: 0xffffffff,Bank1: 0x64
█
```

Update APROM file (1/3)

- Open AP_Update sample code

1. Open startup_M480.s
2. Modify 0x64 to 0x65
3. Compile again

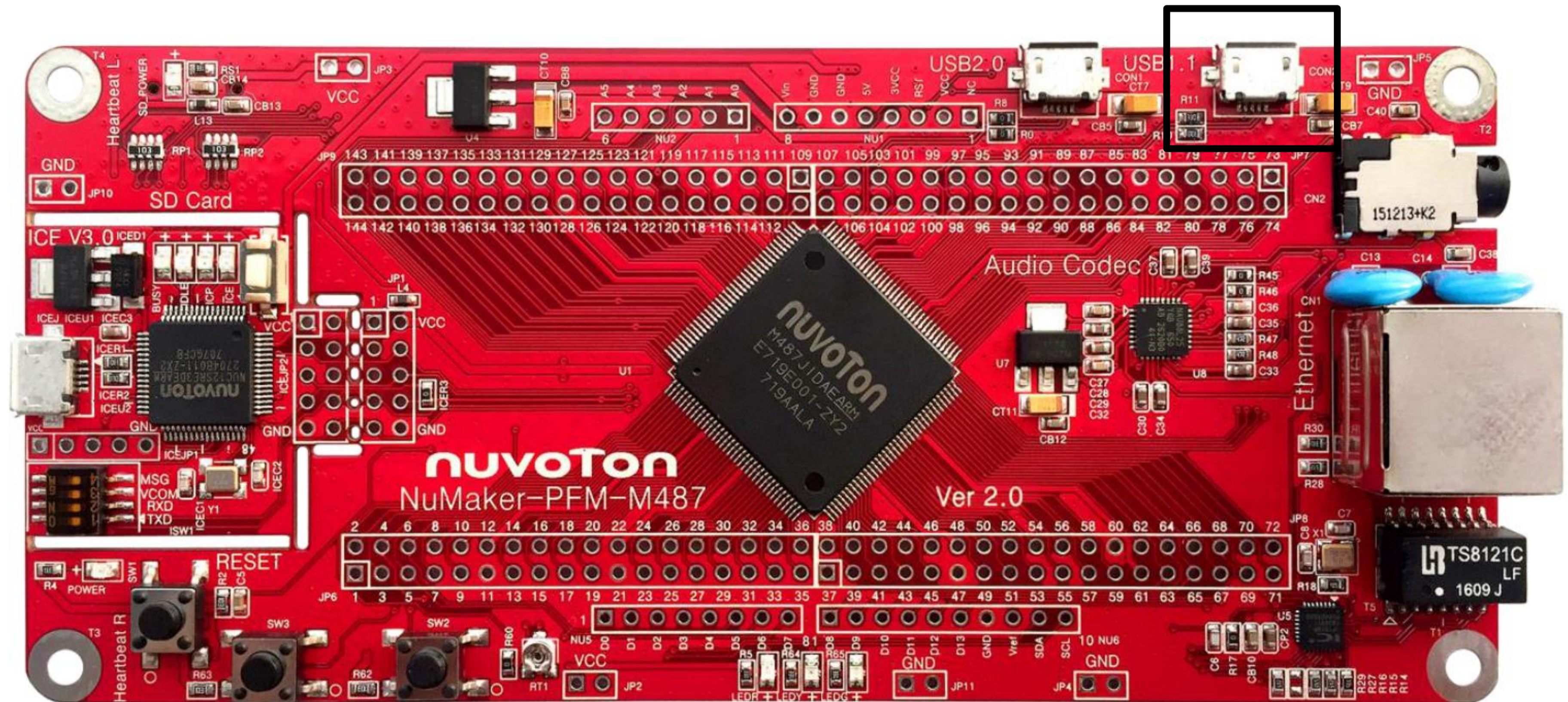
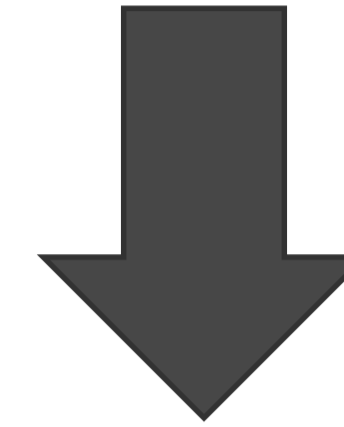


```
D:\Work\Keil_P\M481\M480_BSP_Beta_Site_170705\SampleCode\DualBank_UpdateOperation\AP_Update_1\Keil\AP_Update.uvproj - uVision
File Edit View Project Flash Debug Peripherals Tools SVCS Window Help
response_buff
AP_Update
Project: AP_Update
  AP_Update
    CMSIS
      system_M480.c
      startup_M480.s
    User
      fmc_user.c
      descriptors.c
      hid_transfer.c
      isp_user.c
      targetdev.c
      main.c
    Library
      usbd.c
      clk.c
      retarget.c
      sys.c
      uart.c
      fmc.c
startup_M480.s
43
44 PRESERVE8
45 THUMB
46
47 ; Vector Table Mapped to Address 0 at Reset
48
49
50 AREA RESET, DATA, READONLY
51 EXPORT __Vectors
52 EXPORT __Vectors_End
53 EXPORT __Vectors_Size
54
55 __Vectors DCD __initial_sp ; Top of Stack
56 DCD Reset_Handler ; Reset Handler
57 DCD NMI_Handler ; NMI Handler
58 DCD HardFault_Handler ; Hard Fault Handler
59 DCD MemManage_Handler ; MPU Fault Handler
60 DCD BusFault_Handler ; Bus Fault Handler
61 DCD UsageFault_Handler ; Usage Fault Handler
62 DCD 0x65 ; Reserved
63 DCD 0 ; Reserved
64 DCD 0 ; Reserved
65 DCD 0 ; Reserved
66 DCD SVC_Handler ; SVC Call Handler
67 DCD DebugMon_Handler ; Debug Monitor Handler
68 DCD 0 ; Reserved
69 DCD PendSV_Handler ; PendSV Handler
70 DCD SysTick_Handler ; SysTick Handler
71
72 ; External Interrupts
73 DCD BOD_IRQHandler ; 0: Brown Out detection
74 DCD IRC_IRQHandler ; 1: Internal RC
75 DCD FWRWU_IRQHandler ; 2: Power down wake up
76 DCD RAMPE_IRQHandler ; 3: RAM parity error
77 DCD CKFAIL_IRQHandler ; 4: Clock detection fail
78 DCD Default_Handler ; 5: Reserved
79 DCD RTC_IRQHandler ; 6: Real Time Clock
80 DCD TAMPER_IRQHandler ; 7: Tamper detection
81 DCD WDT_IRQHandler ; 8: Watchdog timer
82 DCD WWDT_IRQHandler ; 9: Window watchdog timer
```

Update APROM file (2/3)

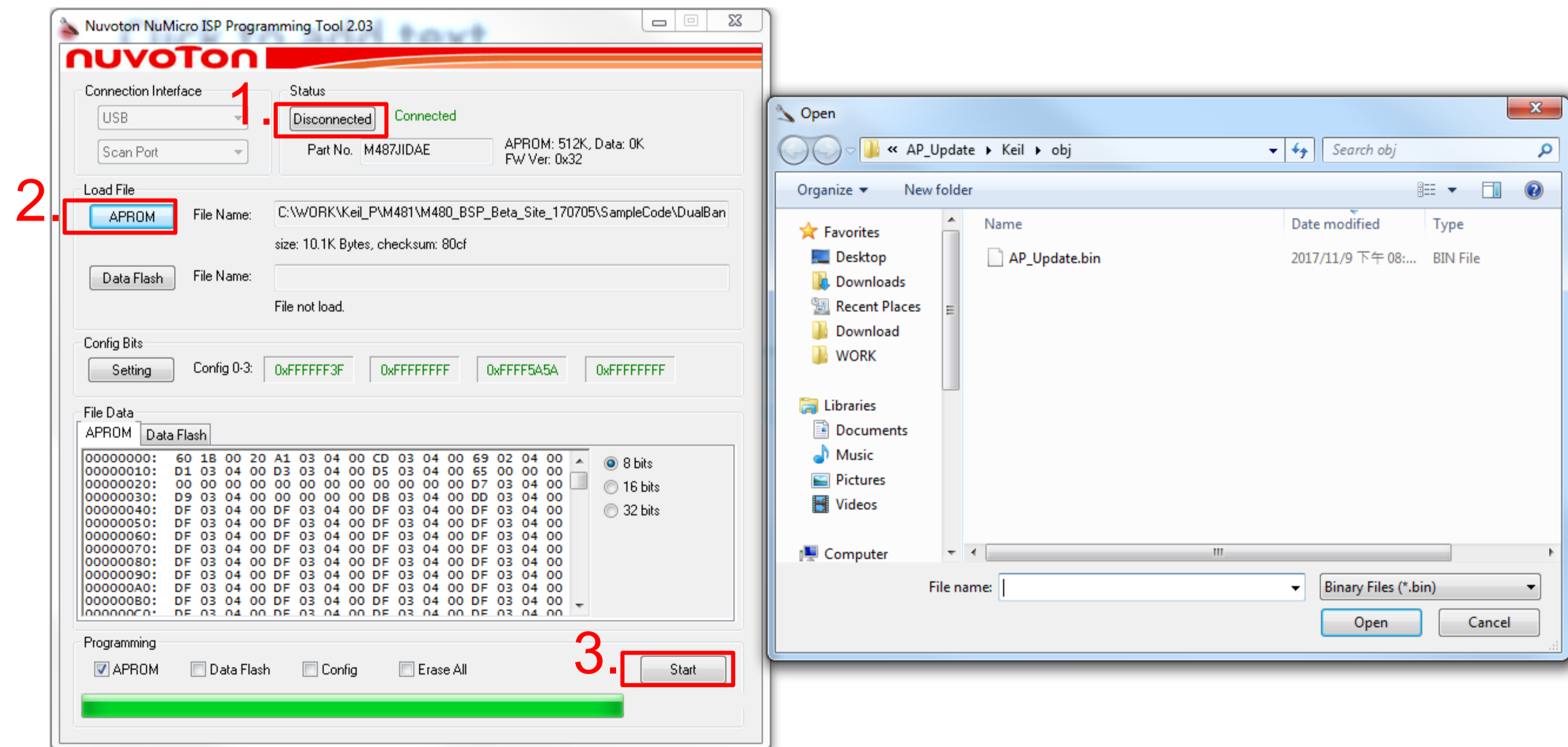
- Connect PC to UAB 1.1 port

USB Port



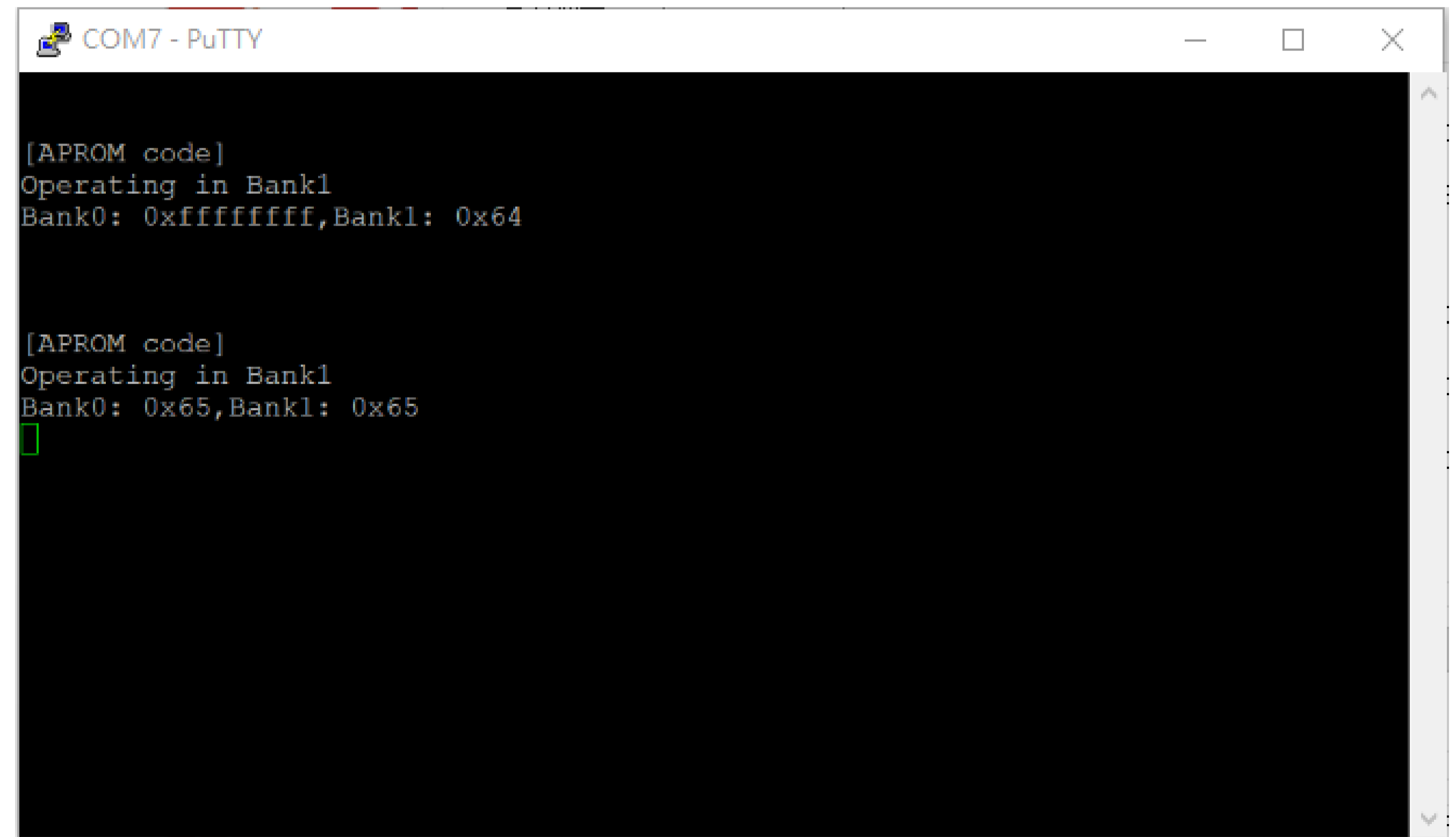
Update APROM file (3/3)

- Open ISP tool
 1. Connect ISP to M480
 2. Choose bin file to APROM: AP_Update.bin
 3. Start download



Check Version

- **Check Putty**
 - Bank 1 will be update to 0x65



A screenshot of a PuTTY terminal window titled "COM7 - PuTTY". The terminal displays two identical blocks of text. The first block shows "[APROM code]", "Operating in Bank1", and "Bank0: 0xffffffff, Bank1: 0x64". The second block shows "[APROM code]", "Operating in Bank1", and "Bank0: 0x65, Bank1: 0x65". A green cursor is visible at the end of the second block.

```
[APROM code]
Operating in Bank1
Bank0: 0xffffffff, Bank1: 0x64

[APROM code]
Operating in Bank1
Bank0: 0x65, Bank1: 0x65
█
```

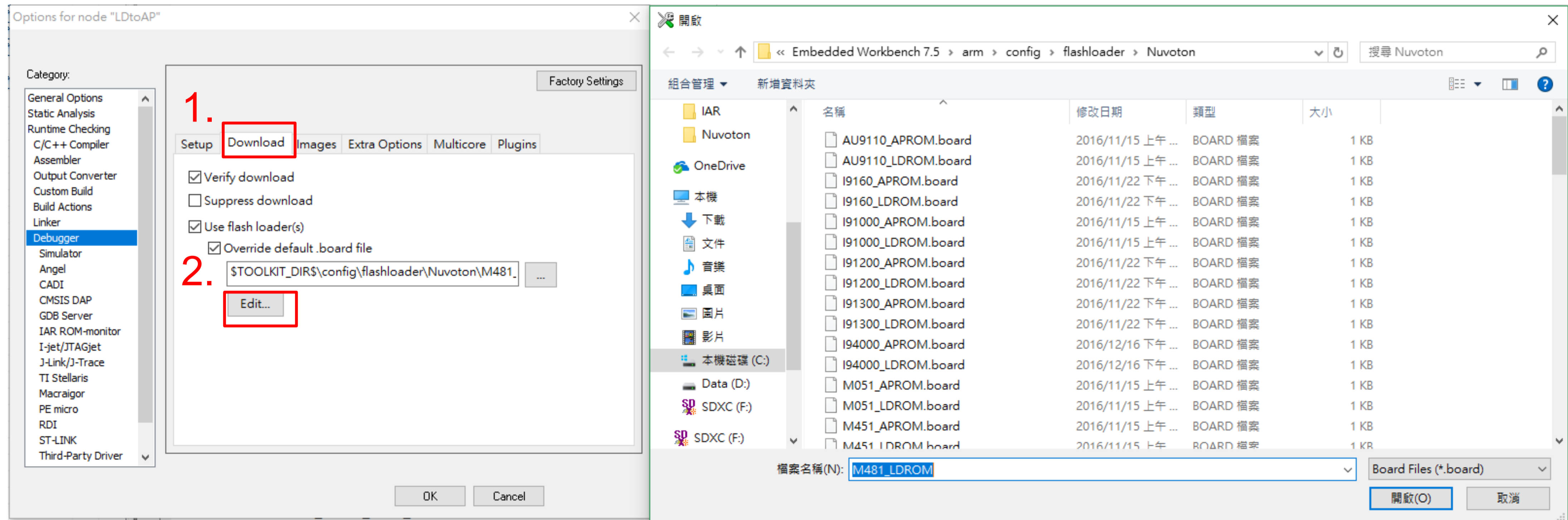
IAR SETTING

For IAR compiler

IAR setting – LDtoAP sample code

1. Open LDtoAP sample code

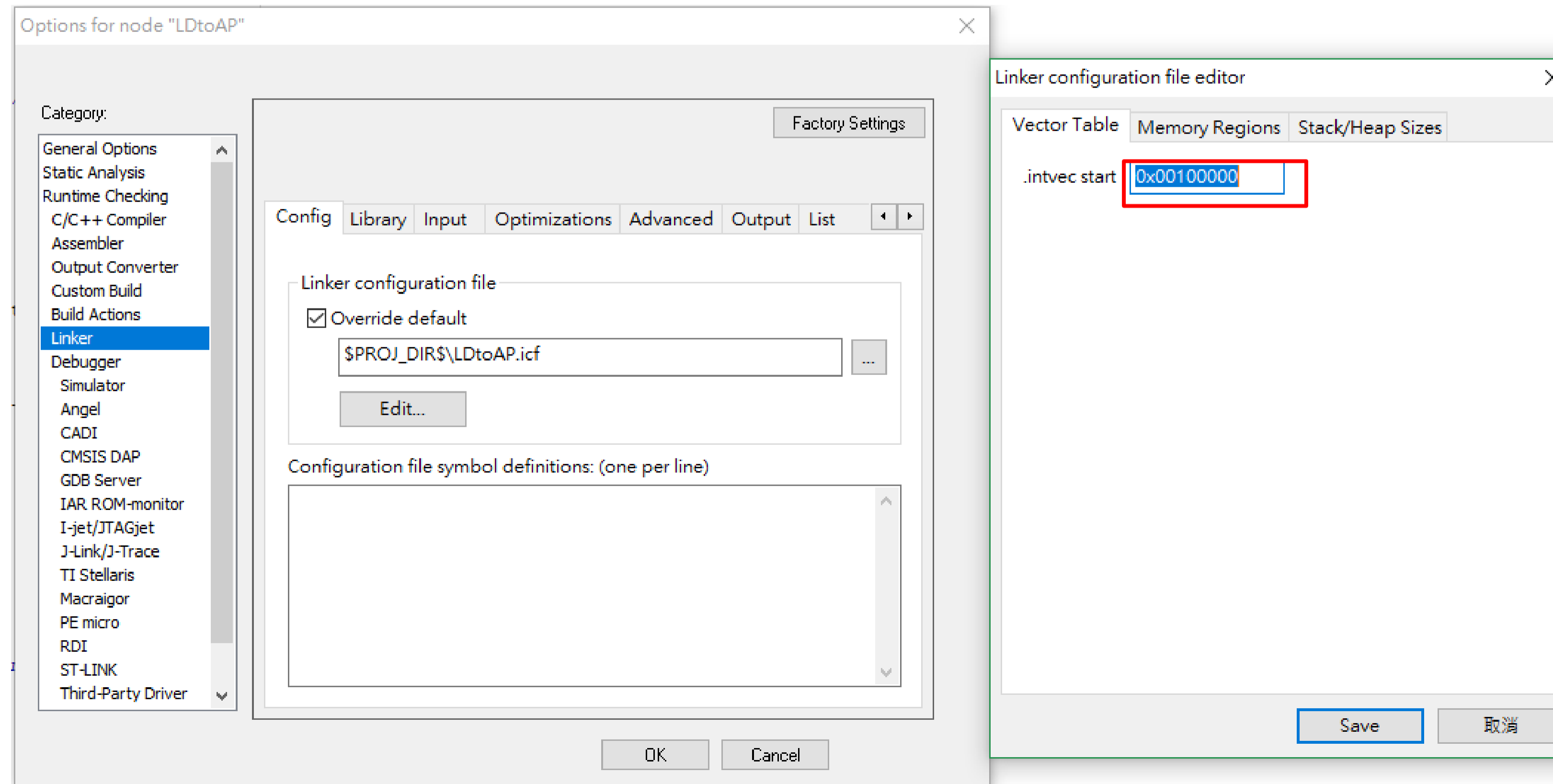
- Select options
- Select Debugger
- Select flash loader: M451_LDROM



IAR setting – LDtoAP sample code

2. Select options

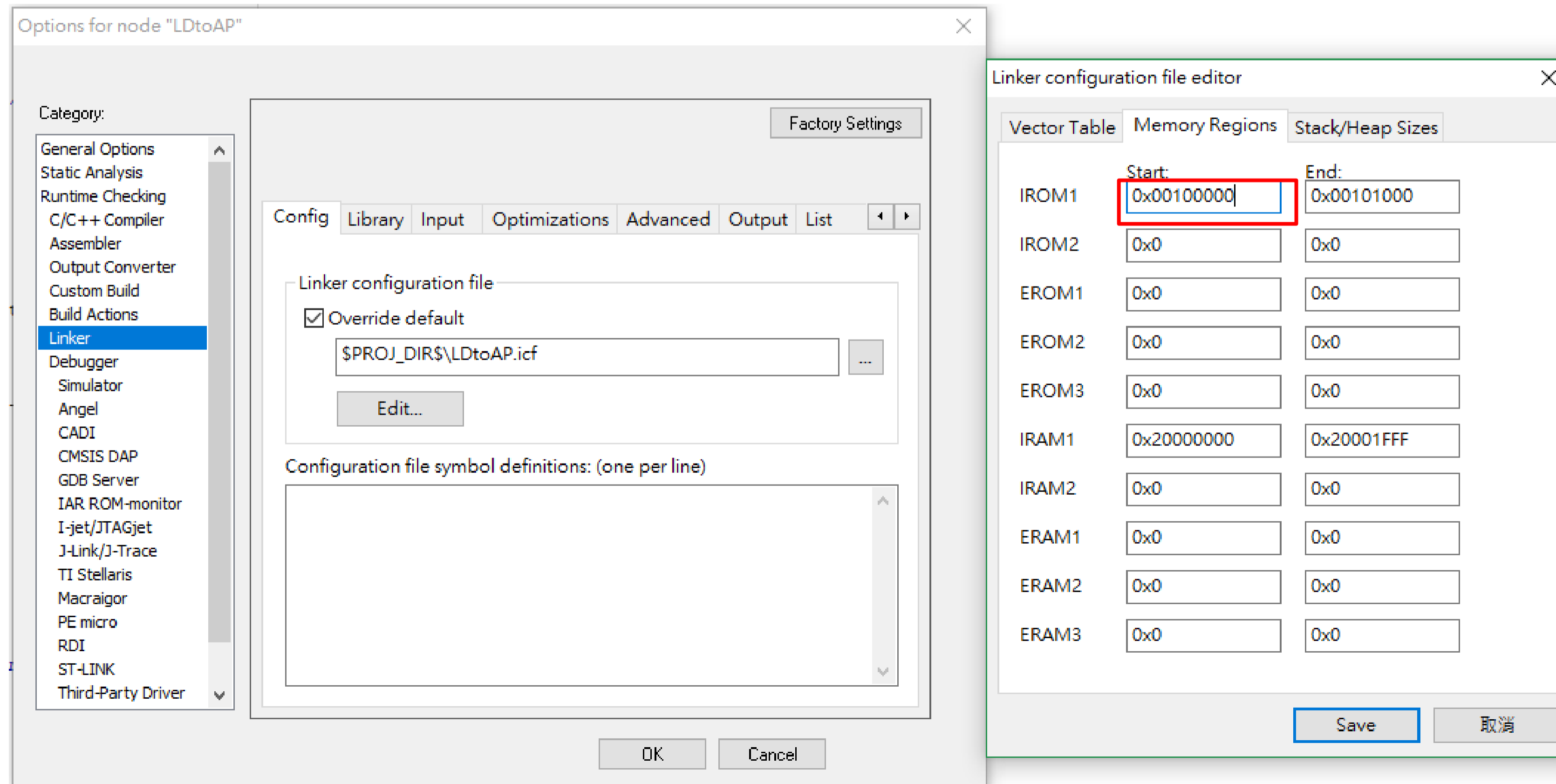
- Select Linker
- .intvec start: 0x00100000 (LDROM)



IAR setting – LDtoAP sample code

3. Select options

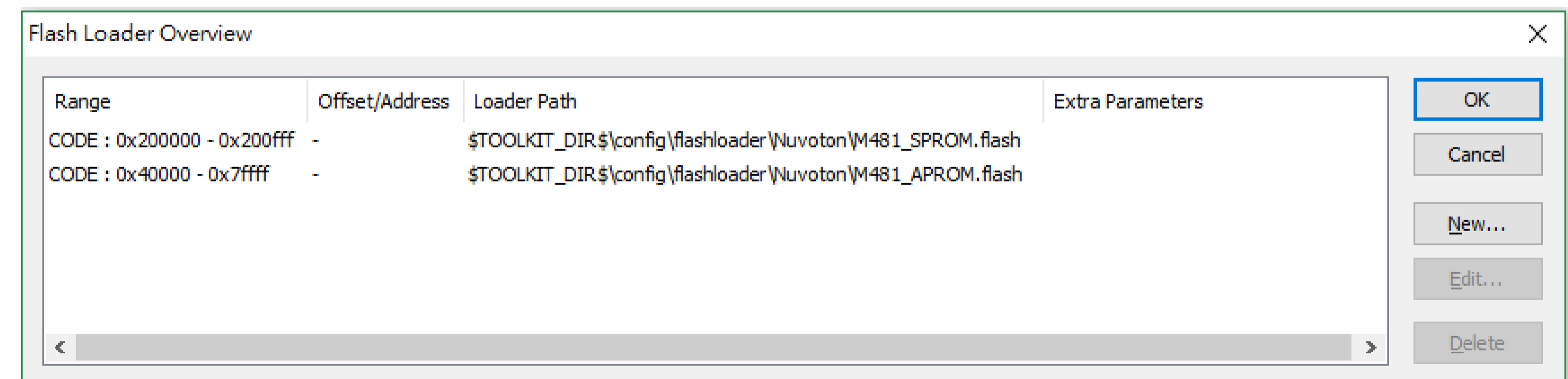
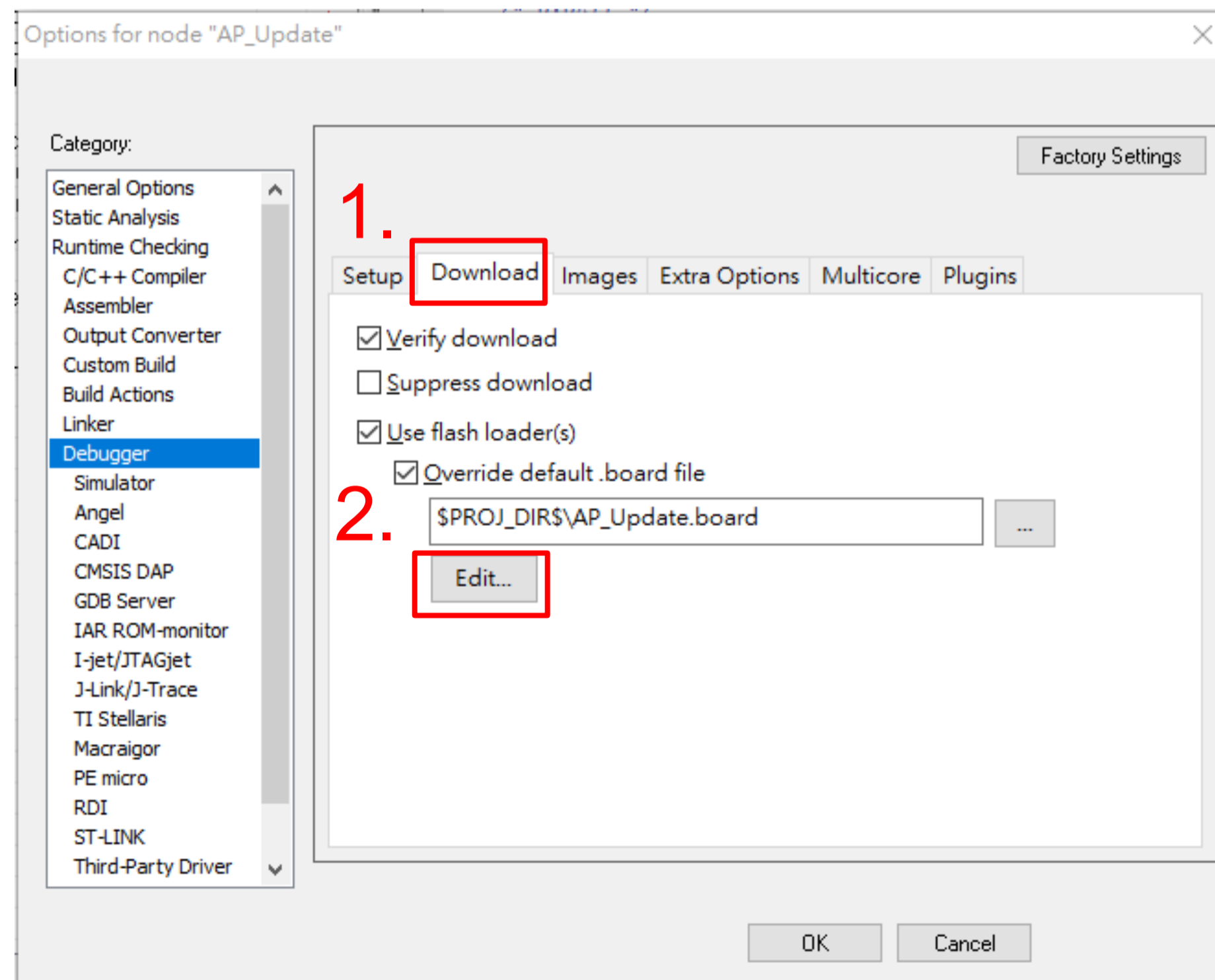
- Select Linker
- IROM1: 0x00100000 to 0x00101000 (LDROM)



IAR setting – AP_Update sample code

1. Open LDtoAP sample code

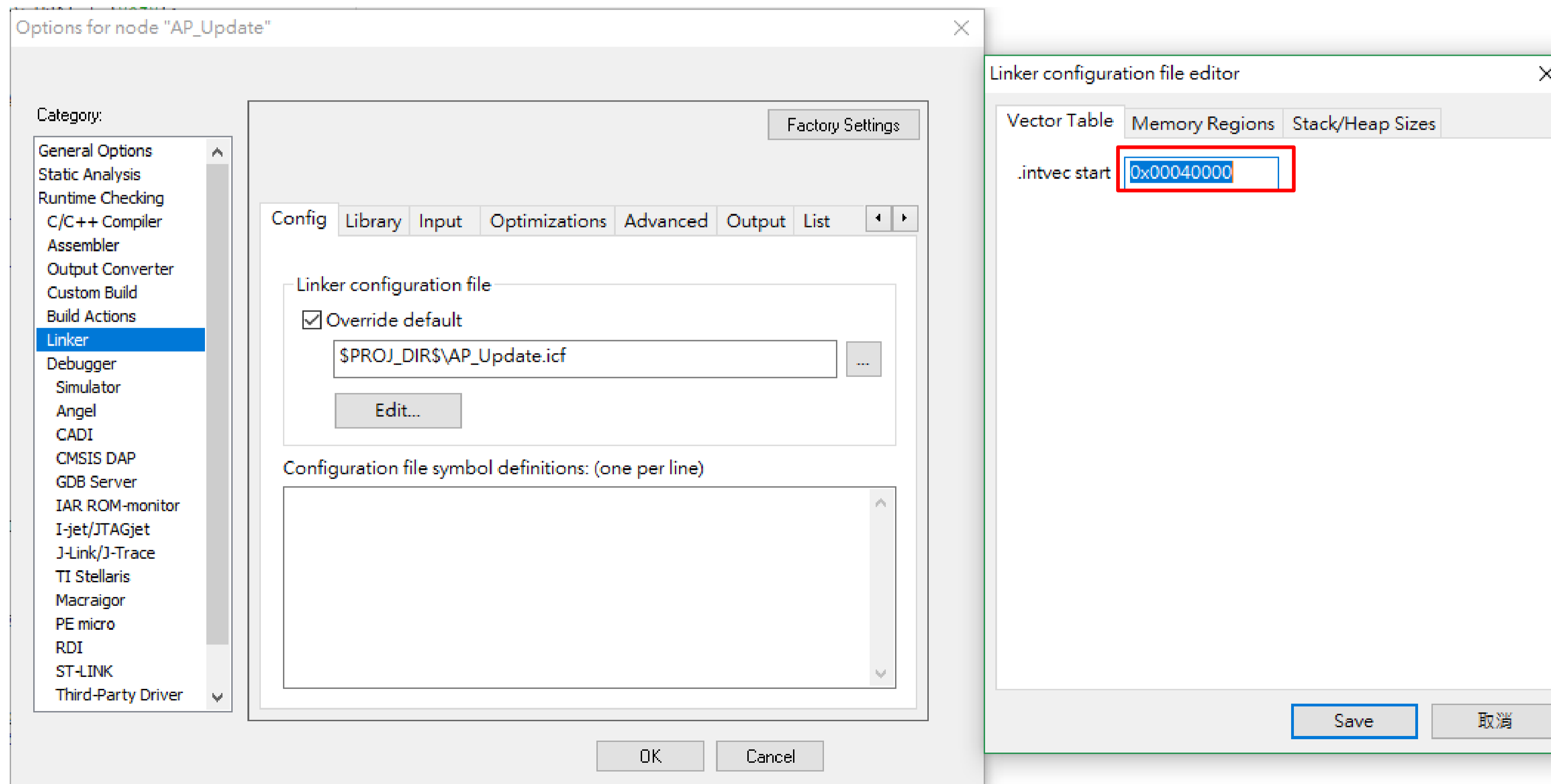
- Select options
- Select Debugger
- Select APROM Bank1:0x40000 - 0x7FFFF



IAR setting – AP_Update sample code

2. Select options

- Select Linker
- .intvec start: 0x00040000 (APROM Bank1)



IAR setting – AP_Update sample code

3. Select options

- Select Linker
- IROM1: 0x00040000 to 0x0007FFFF (LDROM)

