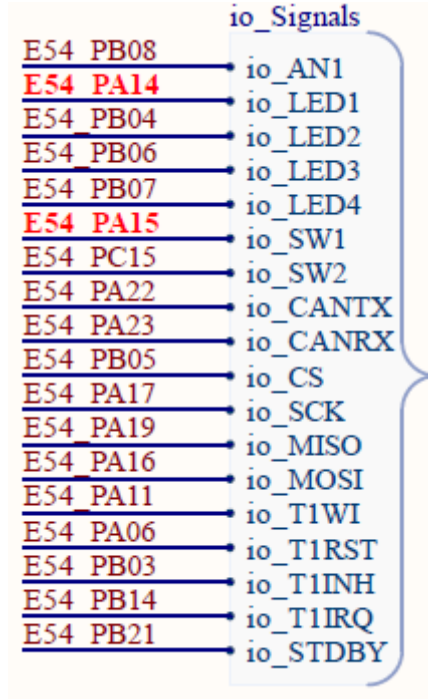
24006 PNP67 Lab2_1
使用 APP-MCU-MASTERS24
ATSAME54P20A

A Leading Provider of Smart, Connected and Secure Embedded Solutions

Version : 2023-July, total 37+ pages, average 40 minutes to review

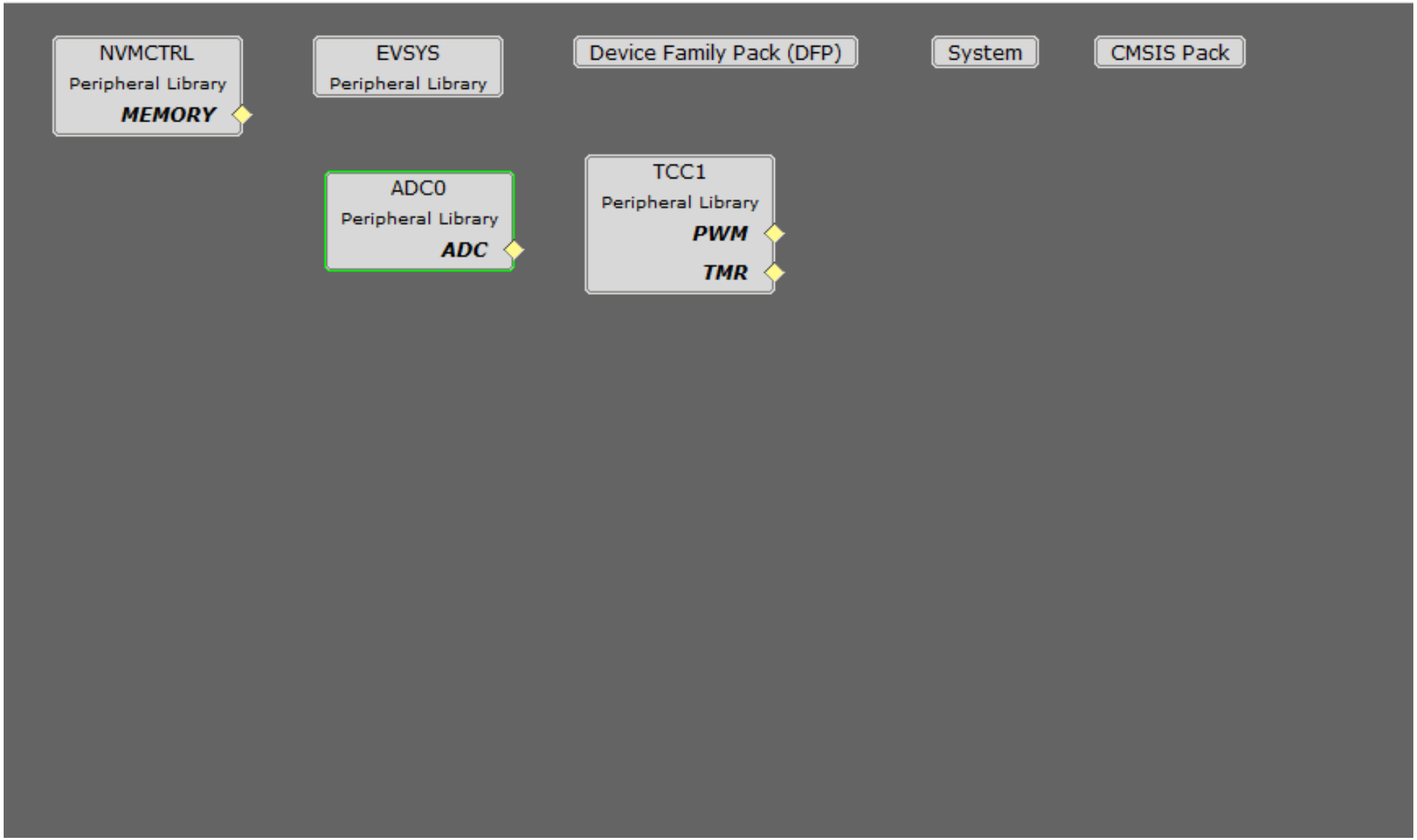
Lab2_1

- **Lab2_1 主要功能**
  - 使用 APP-MCU-MASTERS24 的 VR1 來控制 LED1 的亮度
    - VR1 : ADC0 的 AIN2
    - LED1 : PA14 ， 可以是 TCC1 的 WO2
  - 透過 DMA Channel 0 ，使 ADC0 的轉換結果直接控制 TCC1 的 Duty
    - ADC0 設定為 8-bit resolution 就好
    - TCC 1 設定為 Period 為 255 的 PWM
  - 使用中斷的方式來處理DMA 完成後再次 Enable 的動作



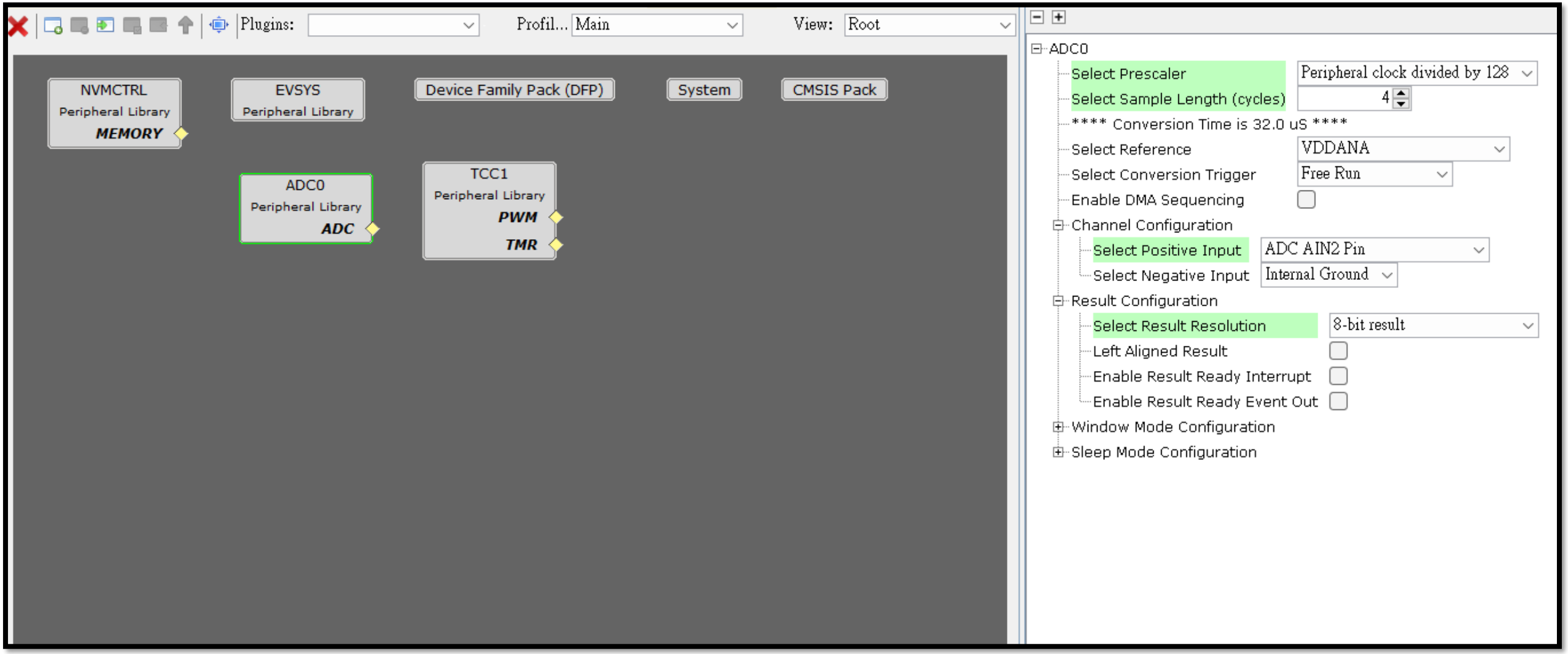

```
DMAC_ChannelCallbackRegister( DMAC_CHANNEL_0,
                &myDmacInterruptHandler, (uintptr_t)NULL);
```

Lab2_1 的 Project Graph 配置



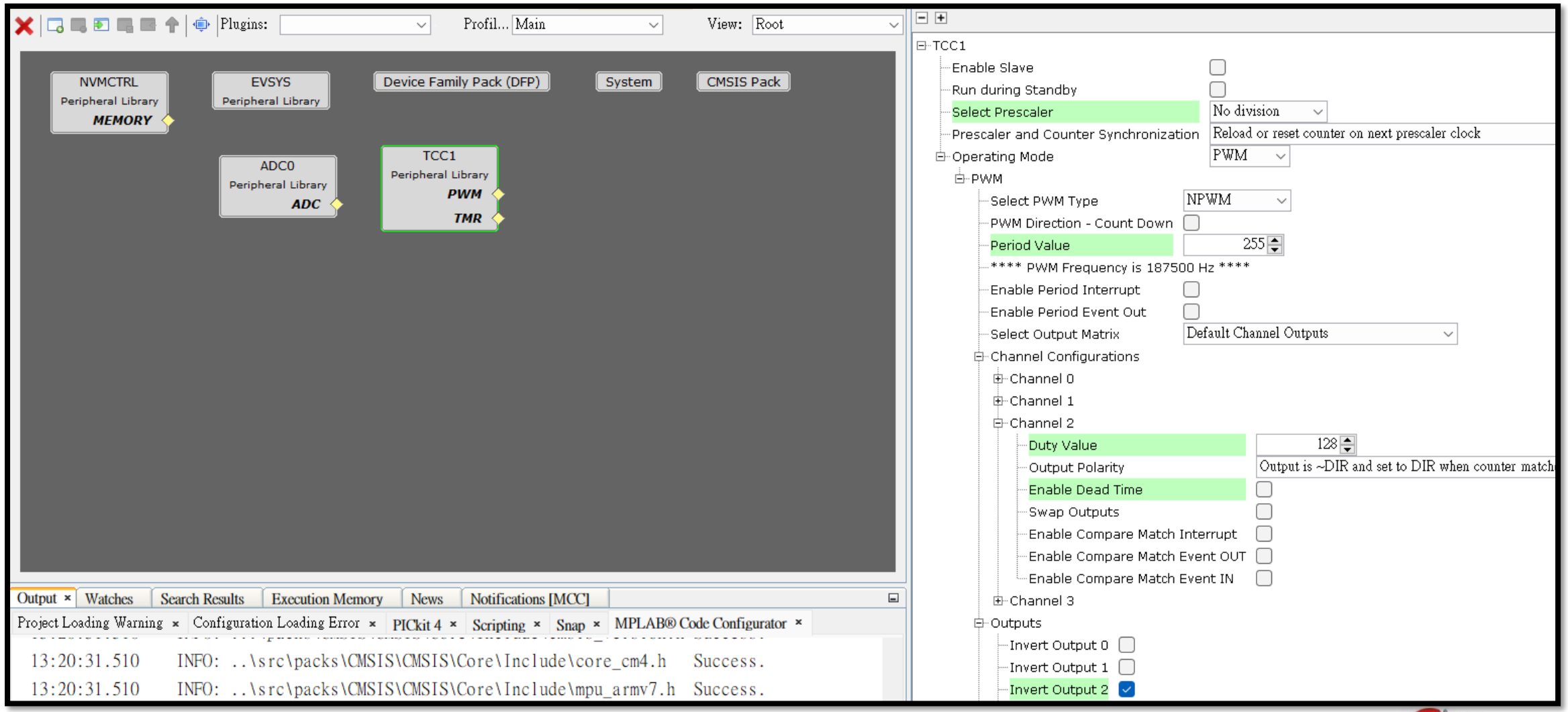
Lab2_1 ADC0 的設定

ADC0 的 Prescaler 設為 divided by 128，故意讓 ADC 的轉換時間大過 TCC1 Period



Lab2_1 TCC1 的設定

TCC1 的設定要點為 : Period Value = 255，以便讓 ADC0 的 8bit 轉換結果來控制 Duty



Lab2_1 的 Pin Setting

PB08 (AN1) 以及 PA14 (LED1) 為本實驗使用的腳位

Order: Pins | Table View | Easy View

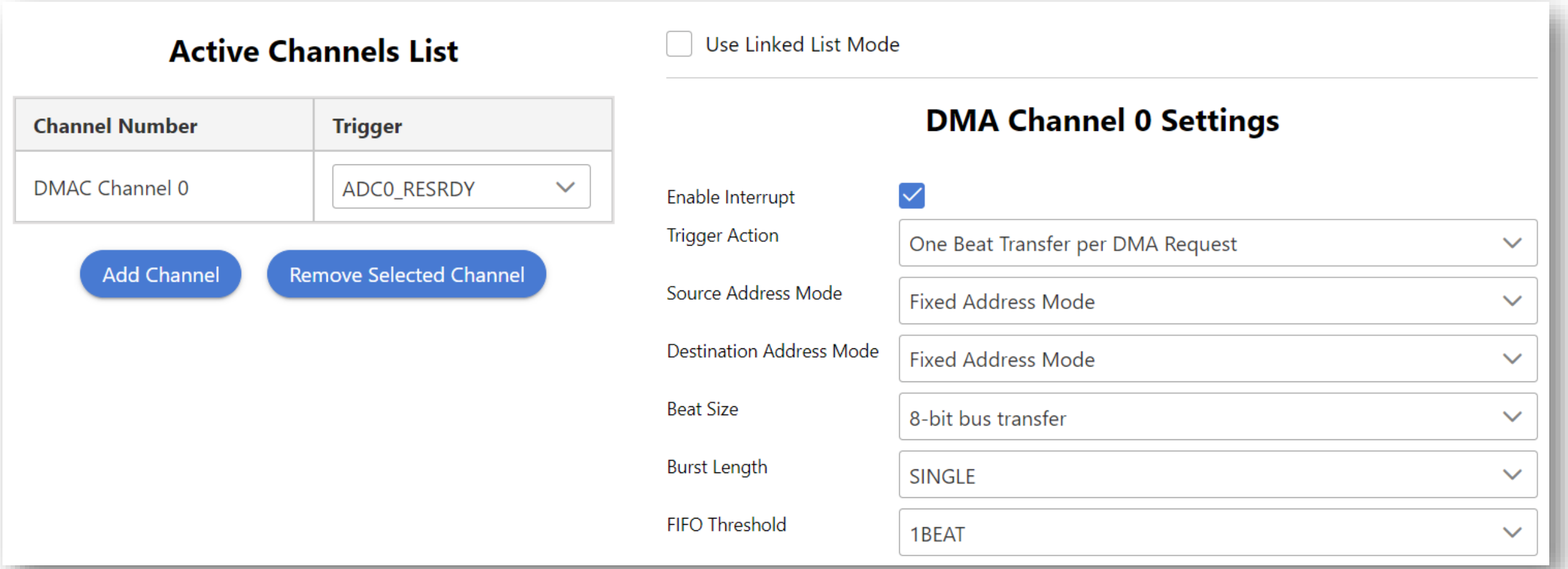
Pin Number	Pin ID	Custom Name	Function	Mode	Direction	Latch	Pull Up	Pull Down	Drive Strength
16	PD01		Available	Digital	High Impedance	Low	☐	☐	NORMAL
17	PB06		Available	Digital	High Impedance	Low	☐	☐	NORMAL
18	PB07		Available	Digital	High Impedance	Low	☐	☐	NORMAL
19	PB08		ADC0_AIN2/X1/Y1	Analog	High Impedance	n/a			NORMAL
20	PB09		Available	Digital	High Impedance	Low	☐	☐	NORMAL
21	PA04		Available	Digital	High Impedance	Low	☐	☐	NORMAL
22	PA05		Available	Digital	High Impedance	Low	☐	☐	NORMAL
23	PA06		Available	Digital	High Impedance	Low	☐	☐	NORMAL

Pin Number	Pin ID	Custom Name	Function	Mode	Direction	Latch	Pull Up	Pull Down	Drive Strength
58	PC14		Available	Digital	High Impedance	Low	☐	☐	NORMAL
59	PC15		Available	Digital	High Impedance	Low	☐	☐	NORMAL
60	PA12		Available	Digital	High Impedance	Low	☐	☐	NORMAL
61	PA13		Available	Digital	High Impedance	Low	☐	☐	NORMAL
62	PA14	E54_LED	TCC1_WO2	Digital	High Impedance	n/a	☐	☐	NORMAL
63	PA15		Available	Digital	High Impedance	Low	☐	☐	NORMAL
64	GND			Digital	High Impedance	Low			NORMAL

io_Signals	
E54_PB08	io_AN1
E54_PA14	io_LED1
E54_PB04	io_LED2
E54_PB06	io_LED3
E54_PB07	io_LED4
E54_PA15	io_SW1
E54_PC15	io_SW2
E54_PA22	io_CANTX
E54_PA23	io_CANRX
E54_PB05	io_CS
E54_PA17	io_SCK
E54_PA19	io_MISO
E54_PA16	io_MOSI
E54_PA11	io_T1WI
E54_PA06	io_T1RST
E54_PB03	io_T1INH
E54_PB14	io_T1IRQ
E54_PB21	io_STDBY

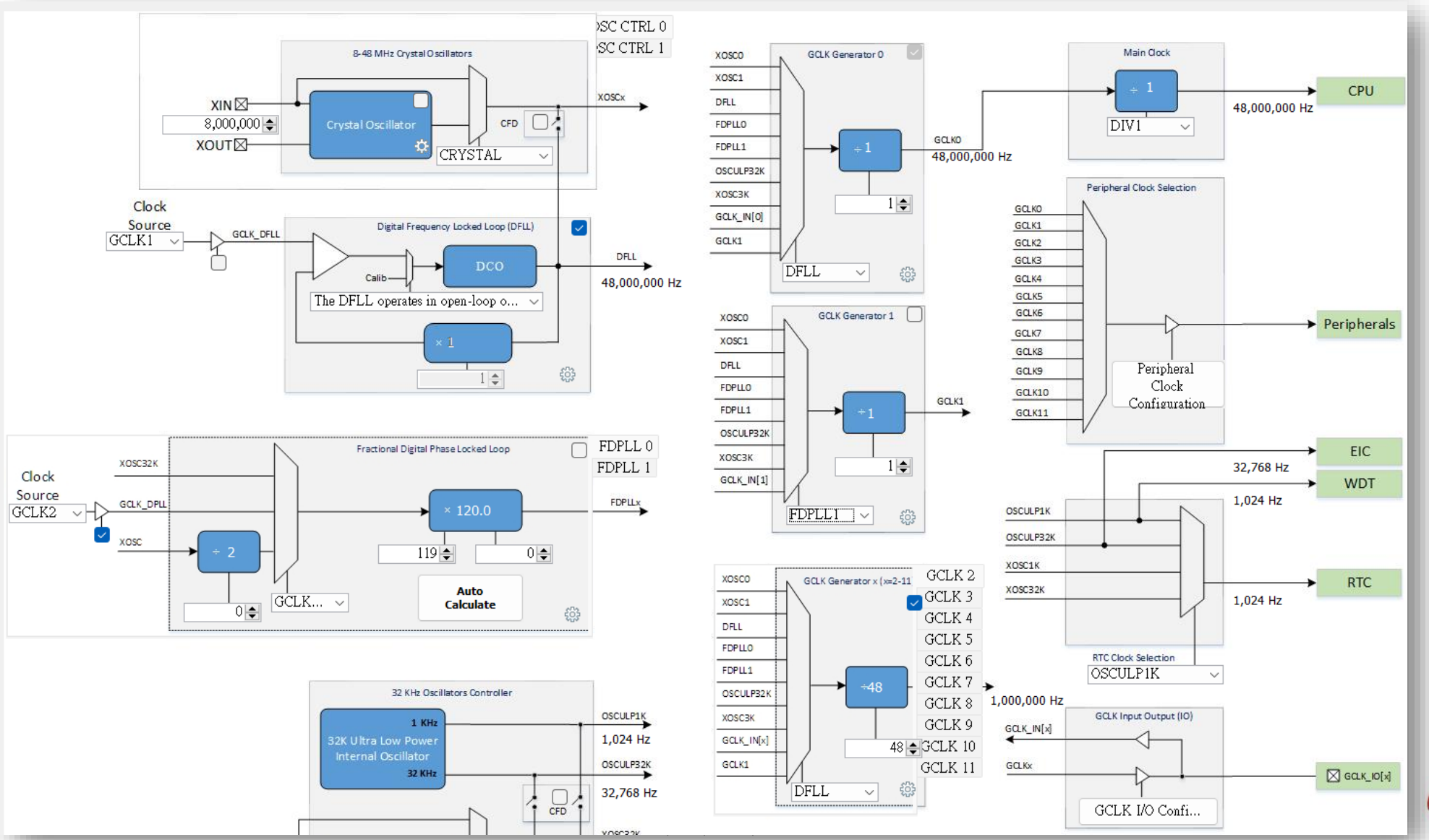
Lab2_1 中DMAC 的設定

設定 ADC0 為 DMA Channel 0 的 Trigger source 並致能中斷



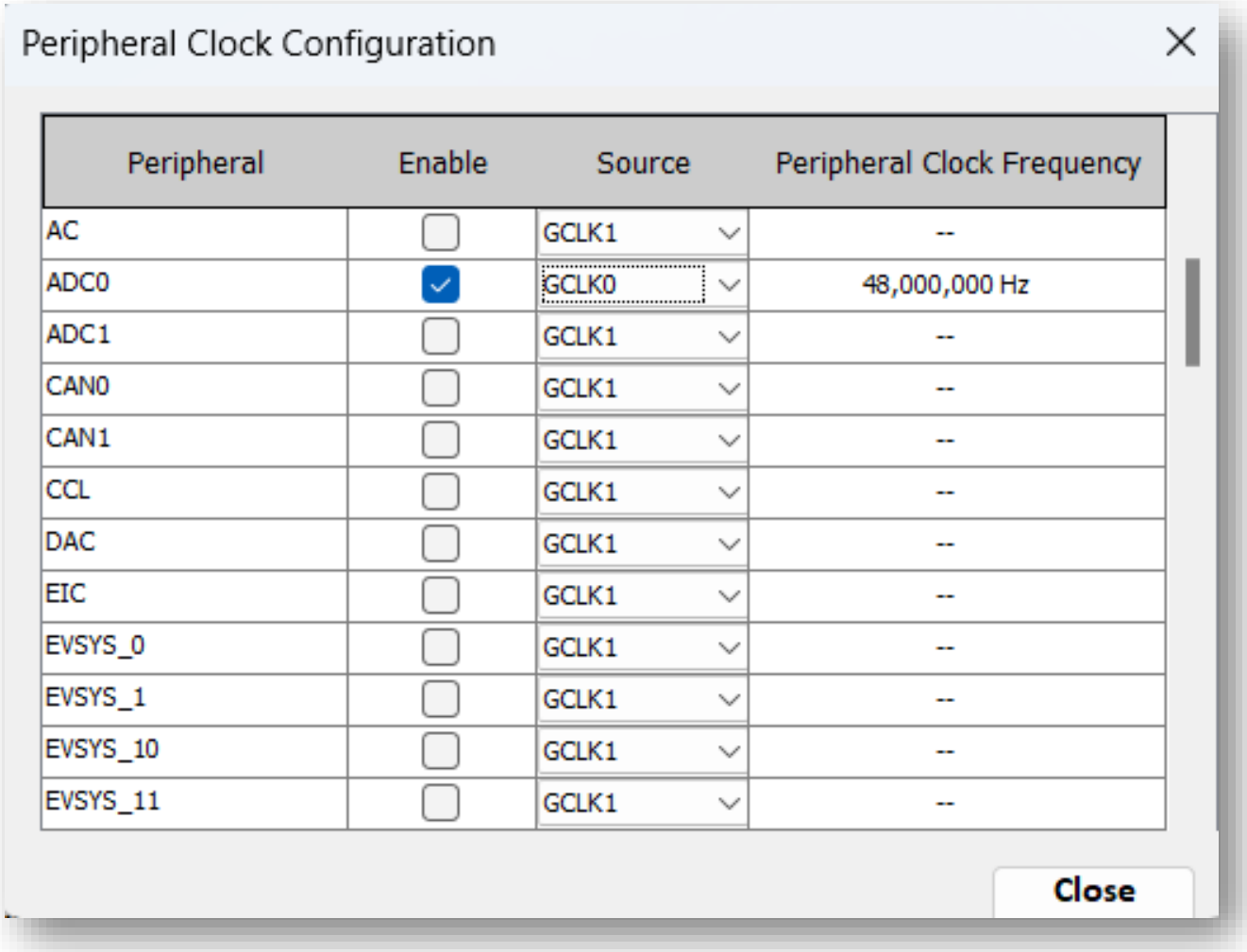
Lab2_1 中Clock 的設定

請注意我們將 Main Clock 由 120Mhz 改為 48 Mhz 並關閉 GCLK1



Lab2_1 中Clock 的設定 - Peripherals

對於使用到的周邊，要記得設定好 clock 的來源才能正常工作



SMART | CONNECTED | SECURE