NUC240 省電模式喚醒中斷

NuMicro® 32 位系列微控制器範例代碼介紹

文件資訊

代碼簡述	本範例代碼在Power Down模式之下，使用GPIO喚醒MCU，進入 Power Down Wakeup 中斷。
BSP 版本	NUC230_240_Series_BSP_CMSIS_V3.01.001
開發平台	NuTiny-EVB-NUC240 V1.2

For additional information or questions, please contact: Nuvoton Technology Corporation.

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1 功能介紹

當NUC240進入Power Down 模式後，經由GPIO狀態的變化，可由Power Down 模式喚醒芯片。喚醒後，NUC240先進入PDWU中斷，再進入GPIO 中斷。
由於Power Down 喚醒的中斷來源是從週邊過來的，如果中斷優先權是同一層，週邊硬體中斷會先執行。若希望Power Down 喚醒中斷先發生，可以將Power Down 喚醒中斷優先權提高。

2 代碼介紹

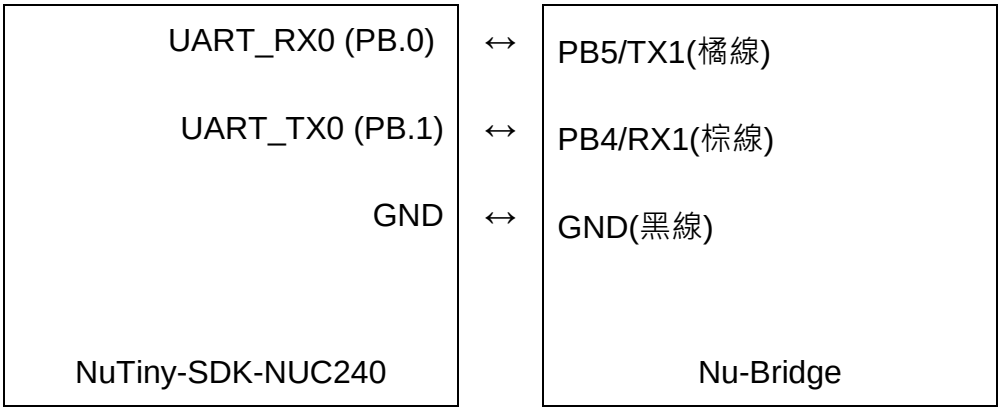
(1)初始化 NUC240 後，設置 PB3 為輸入模式，並開啟下降沿觸發中斷。
(2)開啟 PDWU 中斷
(3)進入 Power Down 模式等待 PB3 下降沿

```
int main(void)
{
    /* Unlock protected registers */
    SYS_UnlockReg();

    /* Init System, peripheral clock and multi-function I/O */
    SYS_Init();

    /* Init UART0 for printf */
    UART0_Init();

    /* Configure PB.3 as Input mode and enable interrupt by falling edge trigger */
    GPIO_EnableInt(PB, 3, GPIO_INT_FALLING);
    NVIC_EnableIRQ(GPAB_IRQn);

    CLK->PWRCON |= CLK_PWRCON_PD_WU_INT_EN_Msk;  /* Enable wake up interrupt source */
    NVIC_EnableIRQ(PWRWU_IRQn);            /* Enable IRQ request for PDWU interrupt */

    NVIC_SetPriority(PWRWU_IRQn,0);
    NVIC_SetPriority(GPAB_IRQn,3);
    /* Waiting for PB.3 falling-edge interrupt event */
    while(1) {
       UART_WAIT_TX_EMPTY(UART0);
       CLK_PowerDown();
    }
```

3 軟體與硬體環境

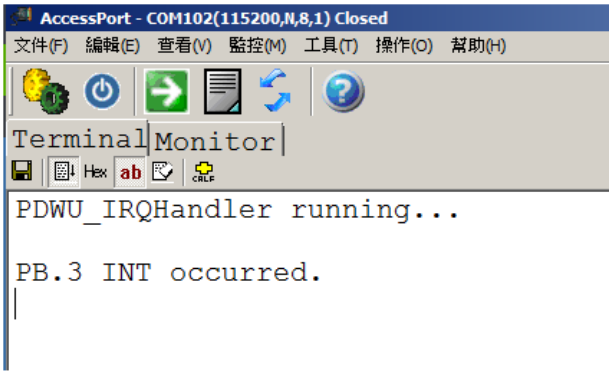
- **軟體環境**
  - BSP 版本
    - NUC230_240_Series_BSP_CMSIS_Rev3.01.001
  - 案例名稱
    - PD_INT_Wakeup.uvproj
- **硬體環境**
  - 硬體需求
    - NuTiny-EVB-NUC240 V1.22
  - 接線圖

使用NuTiny-SDK-NUC240開發板，UART_RX0 (PB.0)、UART_TX0 (PB.1)連接至Nu-Bridge，從UART0打印訊息



在系統管理員中找到 NuBridge Virtual Com Port (COMx)，將COMx填入終端機，Baudrate設置115200。執行程式後，終端機打印出訊息。

當PB3接地時，MCU會被喚醒，之後進PDWU 中斷，再進GPIO中斷。


AccessPort - COM102(115200,N,8,1) Closed
文件(F) 編輯(E) 查看(V) 監控(M) 工具(T) 操作(O) 幫助(H)
Terminal Monitor
Hex ab
CRLF
PDWU_IRQHandler running...
PB.3 INT occurred.

4 目錄資訊

- EC_NUC240_PD_INT_Wakeup_V1.00
  - Library: NUC240 Sample code header and source files.
    - CMSIS: Cortex® Microcontroller Software Interface Standard (CMSIS) V3.01.
    - Device: CMSIS compliant device header file.
    - StdDriver: All peripheral driver header and source files.
  - SampleCode
    - ExampleCode: Example code source file.

5 如何執行範例程式

1. 本專案支援Keil uVersion 4.6及以上版本
2. 根據目錄資訊章節進入SampleCode\ExampleCode\PD_INT_Wakeup\KEIL資料夾，雙擊資料夾中的PD_INT_Wakeup.uvproj
3. 進入編譯模式介面
   a. 編譯
   b. 下載代碼至記憶體
   c. 進入 / 離開除錯模式
4. 進入除錯模式介面
   a. 執行代碼

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