

# Interrupt on STM32F103 MCU

The external interrupt 0 is enabled and the mask bet is set

The screenshot displays the STM32CubeIDE interface with several windows open to configure an external interrupt on PA0.

- Registers Window:** Shows the core registers. R13 (SP) is at 0x20, R14 (LR) is at 0x08, R15 (PC) is at 0x08, and xPSR is at 0x61.
- Code Editor:** Contains the following C code:

```
103: while(1);
104:
105: }
106: }

// INTERRUPT HANDLER
110: void EXTI0_IRQHandler(void)
111: {
112: //pin0 in GPIOA is pres
113: GPIOA_ODR ^= (1 << 13);
114:
115: //clear pending request
116: EXTI_PR |= (1 << 0);
117: }
```
- General Purpose I/O A (GPIOA) Window:** Shows the pin configuration for PA0 as Floating Input. The Configuration & Mode Settings show GPIOA\_CRH: 0x44244444 and GPIOA\_CRL: 0x44444444. The Settings are set to Clock Enabled.
- External Interrupts (EXTI) Window:** Shows the configuration for EXTI0. The Line is 0, Source is PA.0, Port is 0, Mask is 1, Event is 0, Pend is 0, RTrig is 1, FTrig is 0, and Swintr is 0.
- Nested Vectored Interrupt Controller (NVIC) Window:** Shows the configuration for EXTI0. The Interrupt is selected, and the Interrupt Control & State shows INT\_CTRL\_ST: 0x00000000, VECTACTIVE: 0x00, RETTBASE: 0x00, and ISRPREEMPT: 0x00.
- Application Interrupt & Reset Control Window:** Shows the configuration for the application interrupt. The AIRC is 0xFA050000, PRIGROUP is 0: 7.1, VECTRESET is 0x00, and VECTCLRACTIVE is 0x00.
- Vector Table Offset Window:** Shows the configuration for the vector table offset. The VTO is 0x00000000, TBL0FF is 0x000000, and TBLBASE is 0x00.
- Software Interrupt Trigger Window:** Shows the configuration for the software interrupt trigger. The SW\_TRIG\_INT is 0x00000000, and INTID is 0x00.

When the button is pressed, the pending flag is set and the PC went to the ISR code (Defined in startup)

The screenshot shows the Keil uVision IDE with the following components:

- Registers:** The Core registers window shows R0-R15, PSR, and Banked registers. The PC (R15) is at 0x00000000.
- Disassembly:** The assembly window shows the following code:

```
113:      GPIOA_ODR ^= (1 << 13);  
114:      EXTI_PR |= (1 << 0);  
115:      EXTI_PR = (1 << 0);
```
- GPIO Configuration:** The General Purpose I/O (GPIO) window shows PA0-PA7 configured as Floating Input. The EXTI0 interrupt is enabled and pending.
- NVIC Configuration:** The Nested Vectored Interrupt Controller (NVIC) window shows the EXTI0 interrupt enabled and pending.

Finally, the LED is toggled, and the pending flag is cleared

The screenshot shows the Keil uVision IDE with the following components:

- Registers:** The Core registers window shows R0-R15, PSR, and Banked registers. The PC (R15) is at 0x00000000.
- Disassembly:** The assembly window shows the following code:

```
117:      NOP  
118:      MOV R0, #0  
119:      POP R0
```
- GPIO Configuration:** The General Purpose I/O (GPIO) window shows PA0-PA7 configured as Floating Input. The EXTI0 interrupt is no longer pending.
- NVIC Configuration:** The Nested Vectored Interrupt Controller (NVIC) window shows the EXTI0 interrupt no longer pending.