



MCWDT_Interrupt for KIT_T2G-B-H_LITE Customer training workshop

Q3 2024



Scope of work

- This code example demonstrates to configure MCWDT Subcounter0/1 and Subcounter2 operations with interrupt.
- **Device**
 - The TRAVEO™ T2G CYT4BF8CDS device is used in this code example
- **Board**
 - The TRAVEO™ T2G KIT_T2G-B-H_LITE board is used for testing

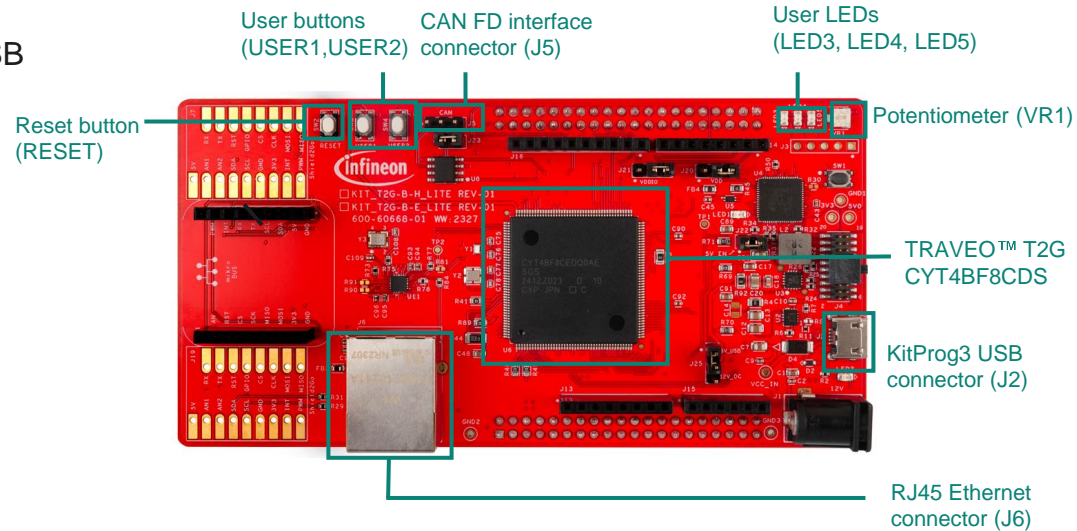
Introduction

- Watchdog Timer features:

- Up to four MCWDTs, each supporting:
 - LFCLK (ILO0, ILO1, WCO, LPECO, or ECO) as the input clock source
 - Fault and device reset generation if not serviced within a configurable interval generates a fault.
 - The WDT generates a fault and triggers a device reset if not serviced within a set interval, preventing system unresponsiveness. Developers can configure the timeout period based on system requirements.
 - Periodic interrupt/wakeup generation in Active, Sleep, and Deep Sleep power modes
 - Three independent counters: two 16-bit counters and one 32-bit counter
 - Warning threshold generates an interrupt to request servicing
 - Window mode
 - Running and freezing timers during Deep Sleep mode
 - Debug

Hardware setup

- This code example is developed for the KIT_T2G-B-H_LITE board
- Connect the PC to the board using the provided USB cable through the KitProg3 USB connector (J2)



Implementation

This example shows how to configure MCWDT _0 Subcounter0/1 and Subcounter2 operations with interrupt.

Follow these steps to configure this code example:

- STDOUT setting
- Initialize the MCWDT_0
- Set up the interrupt handler
- Enable the MCWDT_0 counters

STDOUT setting

- The [*cy_retarget_io_init\(\)*](#) function initializes the GPIO for UART once
 - Initialize P0.0 as UART TX, P0.1 as UART RX (these pins are connected to KitProg3 COM port)
 - The serial port parameters is configured **8N1** and **115200** baud

Implementation (contd.)

Initialize the MCWDT_0

- Call the [Cy_MCWDT_Init\(\)](#) function to initialize the MCWDT_0
 - The configuration of MCWDT is set in **MCWDT_0_config** and is changed using the device configurator
 - Subcounter0/1 is set to generate an interrupt when the counter matches to warning threshold value (for example, 32000)
 - Subcounter2 is set to generate interrupt when bit15 of the counter toggles

Set up the interrupt handler

- Call the [Cy_SysInt_Init\(\)](#) function to set up **ISR_MCWDT_0()** as the ISR(Interrupt Service Routine)
 - The ISR reads the status of the interrupt by calling the [Cy_MCWDT_GetInterruptStatusMasked\(\)](#) function
 - Then it controls each user LED (LED3/LED4/LED5) by calling [Cy_GPIO_Inv\(\)](#) depends on cause of interrupt
 - If the cause is MCWDT Subcounter0, user LED1 (P5.0) is toggled
 - If the cause is MCWDT Subcounter1, user LED2 (P5.1) is toggled
 - If the cause is MCWDT Subcounter2, user LED3 (P5.2) is toggled
 - Clear interrupt by calling the [Cy_MCWDT_ClearInterrupt\(\)](#) function

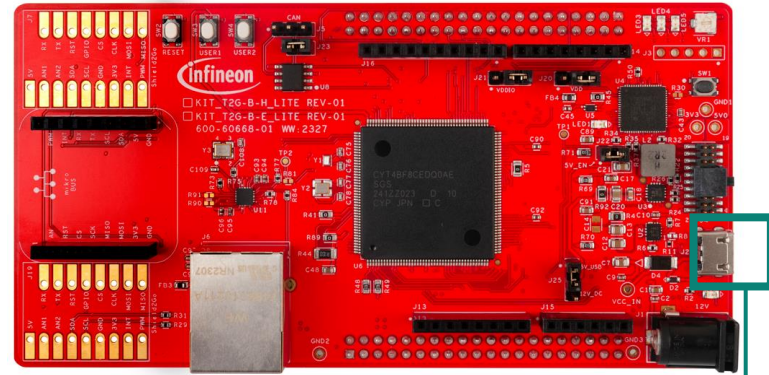
Implementation (contd.)

Enable the MCWDT_0 counters

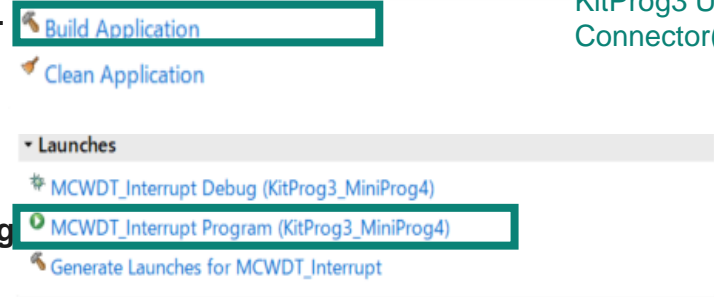
- Unlocks the MCWDT_0 configuration registers by calling the [Cy MCWDT Unlock\(\)](#) function
- Set MCWDT_0 interrupt mask register by calling the [Cy MCWDT SetInterruptMask\(\)](#) function
- Enables MCWDT_0 counters by calling the [Cy MCWDT Enable\(\)](#) function
- Locks out configuration changes to MCWDT_0 registers by calling the [Cy MCWDT Lock\(\)](#) function

Compiling and programming

1. Connect to power and USB cable.
2. Use Eclipse IDE for ModusToolbox™ software for compiling and programming.
3. For compilation:
 - a. Select the target application project in Project Explorer.
 - b. In the Quick Panel, scroll down and click **Build Application** in MCWDT_Interrupt (KIT_T2G-B-H_LITE).
4. Open a terminal program and select the KitProg3 COM port. Set the serial port parameters to 8N1 and 115200 baud.
5. For programming:
 - a. Select the target application project in the Project Explorer.
 - b. In the Quick Panel, scroll down and click **MCWDT _Interrupt Prog (KitProg3_MiniProg4)** under Launches.



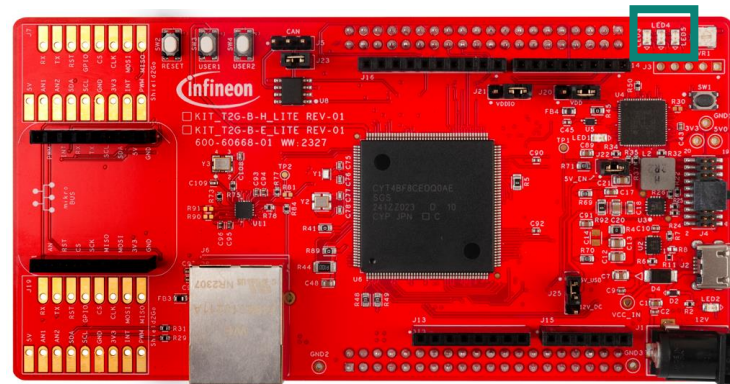
KitProg3 USB Connector(J2)



Run and test

1. After programming, the application starts automatically.
2. Confirm that the user LEDs (LED3, LED4, and LED5) are
3. The terminal application displays the message, as shown the figure.

User LED



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COM4 - Tera Term VT
ファイル(F) 編集(E) 設定(S) コントロール(O) ウィンドウ(W) ヘルプ(H)

***** XMC7000 MCU: Multi-Counter Watchdog Timer Example *****
*
MCWDT initialization is complete. USE LED blinking
    
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References

- **Datasheet**

- [CYT4BF TRAVEO™ T2G 32-bit Automotive MCU based on Arm® Cortex®- M7 dual](#)

- **Architecture reference manual**

- [TRAVEO™ T2G Automotive MCU body controller high architecture reference manual](#)

- **Registers reference manual**

- [TRAVEO™ T2G Automotive MCU: TVII-B-H-8M body controller high registers reference manual](#)

- **PDL/HAL**

- [Peripheral driver library \(PDL\)](#)
- [Hardware abstraction layer \(HAL\)](#)

- **Training**

- [TRAVEO™ T2G training](#)

Revision History

Revision	ECN	Submission Date	Description of Change
**	7782883	2022/07/07	Initial release
*A	8088150	2024/11/13	Replaced development board from KIT_T2G-B-H_EVK to KIT_T2G-B-H_LITE

