

GTM_TOM_Interrupt_1 for KIT_AURIX_TC275_LK

GTM TOM interrupt

AURIX™ TC2xx Microcontroller Training
V1.0.0



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Scope of work

The GTM TOM is configured to trigger an interrupt every 500 ms. The interrupt toggles an LED.

The Generic Timer Module triggers an interrupt every 500 ms. The state of the port pin, where the LED is connected, is toggled inside the Interrupt Service Routine (ISR).

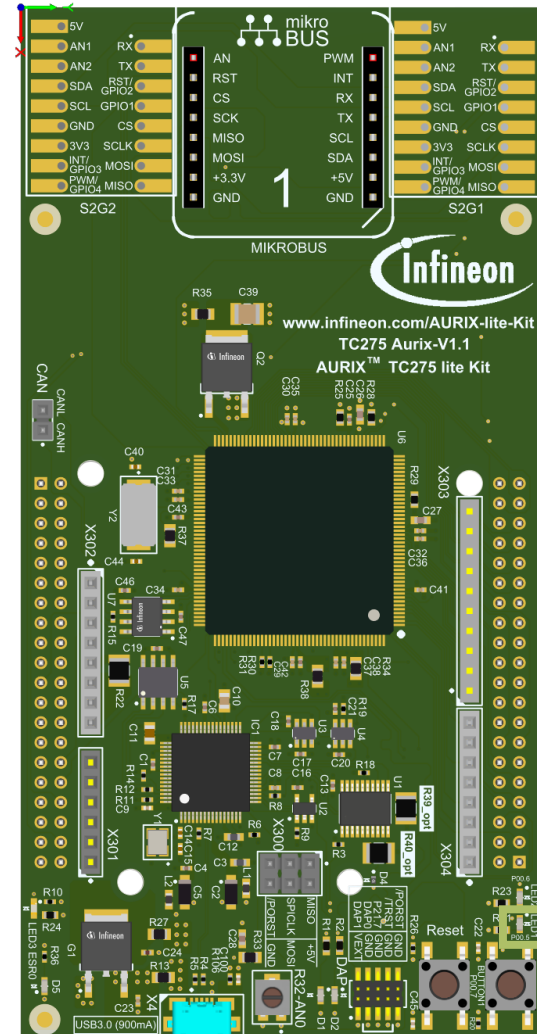
Introduction

- › The Generic Timer Module (GTM) is a modular timer unit designed to accommodate many timer applications
- › It has an in-built Timer Output Module (TOM) that can offers 16 independent channels to generate output signals
- › The Clock Management Unit (CMU) is responsible for clock generation of the GTM. The Fixed Clock Generation (FXU) is one of its subunits and it provides five predefined non-configurable clocks for GTM modules, including the TOM

Hardware setup

This code example has been developed for the board KIT_AURIX_TC275_LITE.

LED1 (1) is used for this example.



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Implementation

Configuring the TOM

The configuration of the TOM is done once in the setup phase by calling the initialization function *initGtmTom()* with the following steps:

- › Enable the GTM by calling the function *IfxGtm_enable()*
- › The function *IfxGtm_Tom_Timer_initConfig()* initializes an instance of the structure *IfxGtm_Tom_Timer_Config* with its default values
- › The *IfxGtm_Tom_Timer_Config* structure allows to set the following parameters to initialize the module:
 - *tom* – Set TOM 1
 - *timerChannel* – Set channel 0 of TOM 1
 - *clock* – Select CMU clock 3
 - *base.frequency* – Set timer frequency to 2 Hz (Interrupt every 500 ms)
 - *base.isrPriority* – Interrupt Service Routine priority
 - *base.isrProvider* – Interrupt Service Routine provider

Implementation

Configuring the TOM

- › Select the FXU clock 3 to divide the clock source by 4096 (***timerConfig.clock = ifxGtm_Tom_Ch_ClkSrc_cmuFxclk3***)
- › Enable the FXU clocks by calling the function ***ifxGtm_Cmu_enableClocks()***
- › The function ***ifxGtm_Tom_Timer_init()*** initializes and activates the TOM with the given configuration

All the functions used for the configuration of the TOM are provided by the iLLD header ***ifxGtm_Tom_Timer.h***.

Implementation

Configuring the LED

The LED configuration is done once in the function ***initGtmTom()*** by setting the port pin mode to output and push-pull by calling the function ***lfxPort_setPinModeOutput()***, provided by iLLD header ***lfxPort.h***.

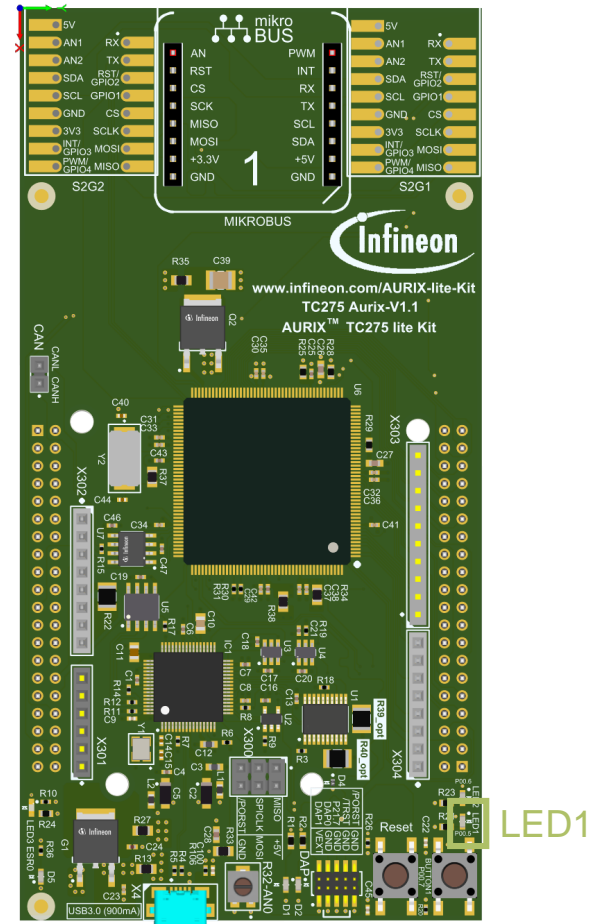
Interrupt Service Routine (ISR)

The ISR implemented in this example contains the following steps:

- › Clear the timer event with the function ***lfxGtm_Tom_Timer_acknowledgeTimerIrq()*** (iLLD header ***lfxGtm_Tom_Timer.h***)
- › Change the LED state by calling the function ***lfxPort_togglePin()*** (iLLD header ***lfxPort.h***)

Run and Test

After code compilation and flashing the device, observe the **LED1**, which should be toggling with a frequency of 2 Hz.



References



- › AURIX™ Development Studio is available online:
- › <https://www.infineon.com/aurixdevelopmentstudio>
- › Use the „*Import...*“ function to get access to more code examples.



- › More code examples can be found on the GIT repository:
- › https://github.com/Infineon/AURIX_code_examples



- › For additional trainings, visit our webpage:
- › <https://www.infineon.com/aurix-expert-training>



- › For questions and support, use the AURIX™ Forum:
- › <https://www.infineonforums.com/forums/13-Aurix-Forum>

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