GTM_ATOM_Interrupt_1
for KIT_AURIX_TC375_LK
GTM ATOM interrupt
Scope of work

The GTM ATOM 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 Advanced Router Unit (ARU) that can be used to exchange specific data between sub-modules without CPU interactions.

- The ARU-connected Timer Output Module (ATOM), which is part of the GTM, is able to generate complex output signals without CPU interactions.

- The Clock Management Unit (CMU) is responsible for clock generation of the GTM. The Configurable Clock Generation Subunit (CFGU) provides eight clock sources for the GTM submodules TIM, TBU, MON and ATOM.
Hardware setup

This code example has been developed for the board KIT_A2G_TC375_LITE.

LED1 (1) is used for this example.
Implementation

Configuring the ATOM

The configuration of the ATOM is done once in the setup phase by calling the initialization function `initGtmAtom()` containing the following steps:

› Enable the GTM by calling the function `IfxGtm_enable()`

› The function `IfxGtm_Atom_Timer_initConfig()` initializes an instance of the structure `IfxGtm_Atom_Timer_Config` with its default values

› The `IfxGtm_Atom_Timer_Config` structure allows to set the following parameters to initialize the module:
  - `atom` – Select ATOM 0
  - `timerChannel` – Select channel 0 of ATOM 0
  - `clock` – Select CMU clock 0
  - `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 ATOM

› Set the CMU clock 0 frequency to 1 MHz with the function `IfxGtm_Cmu_SetClkFrequency()`

› Enable the CMU clock 0 by calling the function `IfxGtm_Cmu_enableClocks()`

› After clock configuration, the function `IfxGtm_Atom_Timer_init()` initializes and activates the ATOM with the user configuration

› Start the timer with the function `IfxGtm_Atom_Timer_run()`

All the functions used for the configuration of the ATOM are provided by the iLLD header `IfxGtm_Atom_Timer.h`.

Configuring the LED

The LED configuration is also done in the function `initGtmAtom()`:

› Set the port pin mode to output and push-pull by calling the function `IfxPort_setPinModeOutput()`, provided by iLLD header `IfxPort.h`
Implementation

Interrupt Service Routine (ISR)

The ISR implemented in this example contains the following steps:

› Clear the timer event with the function `IfxGtm_Atom_Timer_acknowledgeTimerIrq()` in the iLLD header `IfxGtm_Atom_Timer.h`

› Change the LED state by calling the function `IfxPort_togglePin()` in the iLLD header `IfxPort.h`
Run and Test

After code compilation and flashing the device, observe the **LED1 (1)**, which should be blinking.
More code examples can be found on the GIT repository:
> [https://github.com/Infineon/AURIX_code_examples](https://github.com/Infineon/AURIX_code_examples)

For additional trainings, visit our webpage:
> [https://www.infineon.com/aurix-expert-training](https://www.infineon.com/aurix-expert-training)

For questions and support, use the AURIX™ Forum:
IMPORTANT NOTICE

The information given in this document shall in no event be regarded as a guarantee of conditions or characteristics ("Beschaffenheitsgarantie").

With respect to any examples, hints or any typical values stated herein and/or any information regarding the application of the product, Infineon Technologies hereby disclaims any and all warranties and liabilities of any kind, including without limitation warranties of non-infringement of intellectual property rights of any third party.

In addition, any information given in this document is subject to customer's compliance with its obligations stated in this document and any applicable legal requirements, norms and standards concerning customer’s products and any use of the product of Infineon Technologies in customer’s applications.

The data contained in this document is exclusively intended for technically trained staff. It is the responsibility of customer’s technical departments to evaluate the suitability of the product for the intended application and the completeness of the product information given in this document with respect to such application.

For further information on the product, technology, delivery terms and conditions and prices please contact your nearest Infineon Technologies office (www.infineon.com).

WARNINGS

Due to technical requirements products may contain dangerous substances. For information on the types in question please contact your nearest Infineon Technologies office.

Except as otherwise explicitly approved by Infineon Technologies in a written document signed by authorized representatives of Infineon Technologies, Infineon Technologies’ products may not be used in any applications where a failure of the product or any consequences of the use thereof can reasonably be expected to result in personal injury.