

# ERU\_Interrupt\_1 for KIT\_AURIX\_TC375\_LK

External interrupt generation

AURIX™ TC3xx Microcontroller Training  
V1.0.0



[Please read the Important Notice and Warnings at the end of this document](#)

## Scope of work

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**The ERU is used to generate an interrupt on each rising and falling edge at an input pin.**

The code example uses the External Request Unit (ERU) to generate an interrupt for each falling and rising edge at an input pin. The falling and rising edges are generated with the pin P00.7 connected to the board's button. If an interrupt occurs, an LED will be toggled.

# Introduction

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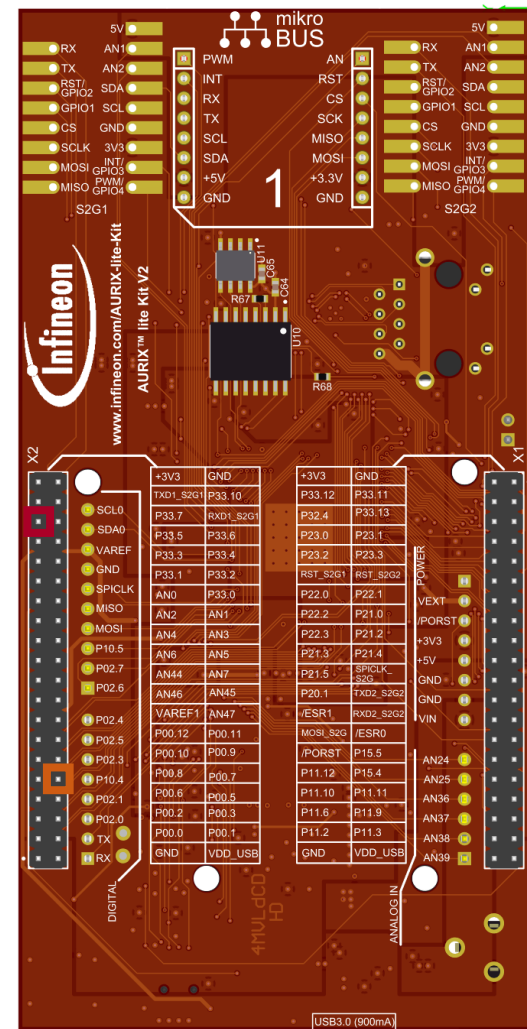
- › The External Request Unit (ERU) is a versatile event and pattern detection unit
- › Its main task is the **generation of interrupts based on selectable trigger events at different inputs**, e.g. to generate external interrupt requests if an edge occurs at an input pin
- › The detected events can also be used by other modules to trigger or to gate module specific actions

# Hardware setup

This code example has been developed for the board KIT\_A2G\_TC375\_LITE.

The two pins P33.7 and P00.7 have to be connected to each other.

|                     | X2 |    |                   |
|---------------------|----|----|-------------------|
| +3V3                | 39 | 40 | GND               |
| TXD1_S2G1 - P33.9   | 37 | 38 | P33.10            |
| P33.7               | 35 | 36 | P33.8 - RXD1_S2G1 |
| P33.5               | 33 | 34 | P33.6             |
| P33.3               | 31 | 32 | P33.4             |
| P33.1               | 29 | 30 | P33.2             |
| Potentiometer - AN0 | 27 | 28 | P33.0             |
| AN2                 | 25 | 26 | AN1               |
| AN4                 | 23 | 24 | AN3               |
| AN6                 | 21 | 22 | AN5               |
| AN44                | 19 | 20 | AN7               |
| AN46                | 17 | 18 | AN45              |
| VAREF1              | 15 | 16 | AN47              |
| P00.12              | 13 | 14 | P00.11            |
| P00.10              | 11 | 12 | P00.9             |
| P00.8               | 9  | 10 | P00.7 - Button1   |
| LED2 - P00.6        | 7  | 8  | P00.5 - LED1      |
| P00.2               | 5  | 6  | P00.3             |
| P00.0               | 3  | 4  | P00.1             |
| GND                 | 1  | 2  | VDD_USB           |

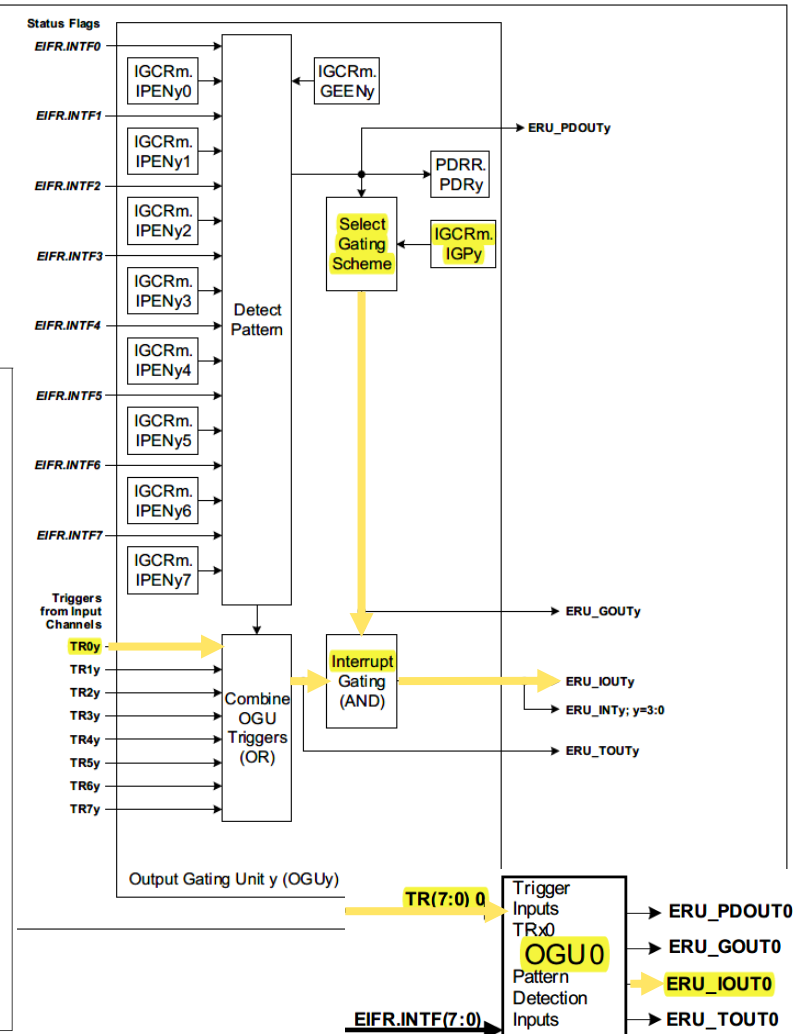
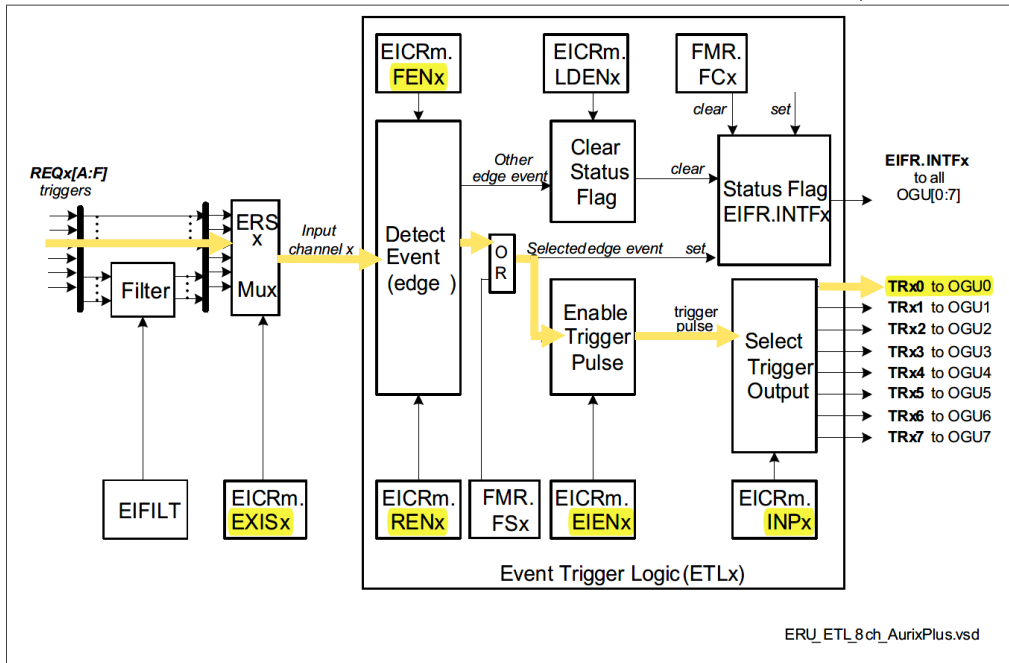


# Implementation

- › To generate an interrupt via falling and rising edges on an input pin, a few configuration steps are required:
  - Initialize external request pin (***IfxScuEru\_initReqPin()***)
  - Select which edge should trigger the interrupt (***IfxScuEru\_enableRisingEdgeDetection()*** and/or ***IfxScuEru\_enableFallingEdgeDetection()***)
  - Enable generation of trigger events with the function ***IfxScuEru\_enableTriggerPulse()***
  - Choose the output channel by selecting the Output Gating Unit (OGUz) and the trigger pulse output (TRxz)
    - An event from the Event Trigger Logic (ETL0) triggers the OGU0 (signal TRx0). The function ***IfxScuEru\_connectTrigger()*** determines the output channel for the trigger event
  - Select the condition to generate an interrupt with the function ***IfxScuEru\_setInterruptGatingPattern()***
  - Configure and enable the service request with the functions ***IfxSrc\_init()*** and ***IfxSrc\_enable()***
  
- › The functions above are provided by the iLLD headers ***IfxScuEru.h*** and ***IfxSrc.h***.

# Implementation

- > The below figures from the AURIX™ TC3xx User's Manual illustrate the configuration steps that were followed in this example



# Implementation

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## The Interrupt Service Routine (ISR)

The ERU generates **interrupt requests** according to its configuration. These trigger an **ISR**, which toggles an LED.

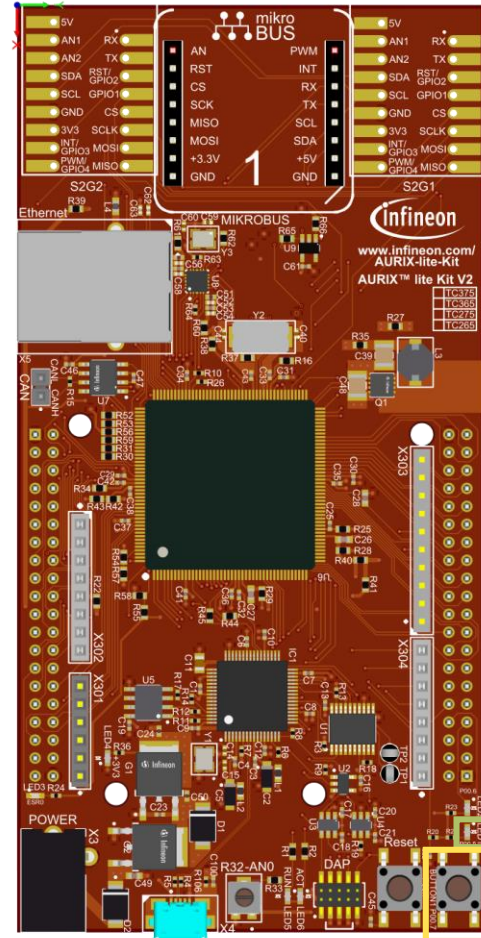
The method implementing the ISR needs to be assigned a **priority** via the macro ***IFX\_INTERRUPT(isr, vectabNum, priority)***.

When triggered, the ISR **blinks** the LED by **toggleing** the **state** of the connected pin using the function ***IfxPort\_setPinState()***.

# Run and Test

After code compilation and flashing the device, perform the following steps:

1. Connect the two pins P33.7 and P00.7 to each other. P00.7 (the button) is used to generate the falling and rising edges by toggling the its state. P33.7 is the input of the ERU which generates the interrupts on falling and rising edges
2. Toggle the P33.7 pin state by pressing the button on the board
3. Check that LED1 (1) is changing its state when the button is pressed





# 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](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:
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**Document reference**

**ERU\_Interrupt\_1\_KIT\_TC375\_LK**

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