

# SCU\_Power\_Down\_Standby\_1 for KIT\_AURIX\_TC275\_LK

## Power Saving in Standby Mode

AURIX™ TC2xx 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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**Set the system to standby mode and use an external trigger signal on PinA to return to active mode.**

This example shows how to set the microcontroller in power saving mode standby. The standby mode is triggered via a SW request by writing into the Power Management Control and Status Register. The system is woken up from standby mode using PinA (port pin 14.1) and can be controlled by a terminal program.

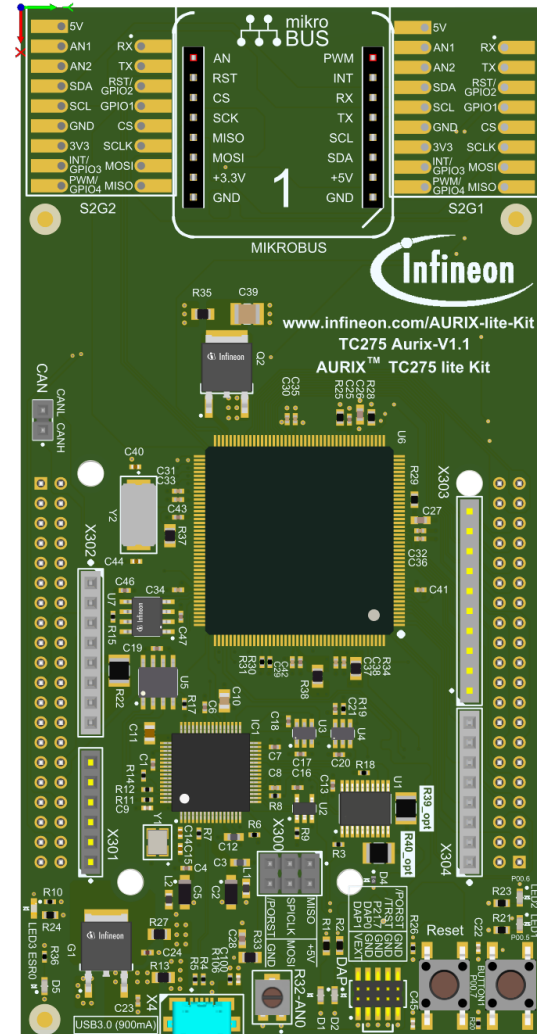
# Introduction

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- › The Power Management scheme allows activation of power down modes so that the AURIX™ microcontroller system operates with the minimum required power for the corresponding application state
- › The most significant power saving mode is the Standby mode. In this mode the entire microcontroller system is switched off besides some system blocks that constitute the Standby domain
- › Waking-Up from standby mode re-powers the microcontroller core domain thus the application software restarts

# Hardware setup

This code example has been developed for the board KIT\_AURIX\_TC275\_LITE.



# Implementation

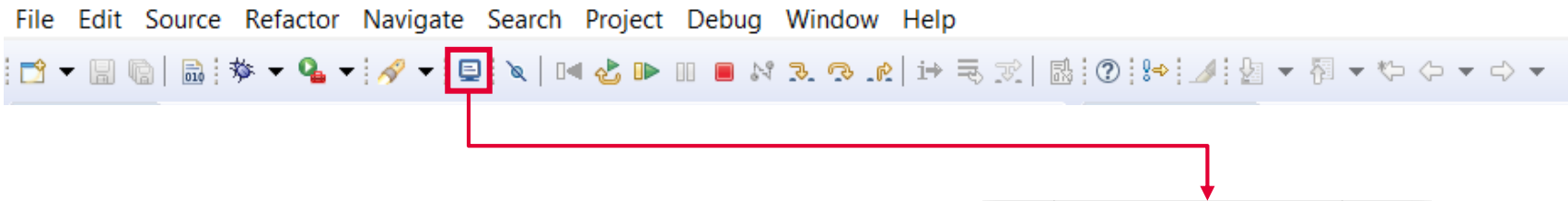
## Standby mode implementation:

- › The routine ***runStandby()*** is used to put the microcontroller system in Standby mode
  - Two configurations in terms of indication are done using **LED2** and **LED1**
    - The **LED2** connected to pin 00.6 is switched on and indicates the start of the example
    - The **LED1** connected to pin 00.5 is switched off
  - The application waits for approximately four seconds
  - Then **LED1** is switched on to signal that Standby mode is entered in approximately one second
  
- › The routine ***stepIntoStandbyMode()*** executes the following sequence to enter the Standby mode
  1. Clear **Safety Endinit** and **CPU Endinit**
  2. Clear all status flags within **PMSWSTAT** register
  3. Write the Wake-Up configuration into control status register **PMSWCRO**
    - Configure PinA connected to port pin 14.1 as the desired Wake-Up trigger request
    - Configure PinA Wake-Up trigger to react on any edge
    - Disable ESR0 as a Wake-Up trigger
    - Disable Wake-Up on  $V_{EXT}$  ramp-up
  4. Request Standby mode by writing into the register **PMCSR0**
  5. Set **Safety Endinit** and **CPU Endinit**

**Note:** The standby mode becomes active as soon as the CPU Endinit is set.

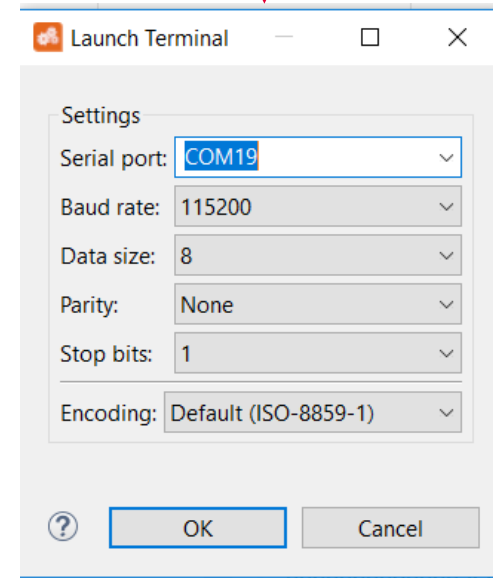
# Run and Test

- > For this training, a serial monitor is required for bringing the microcontroller out of standby mode. The monitor can be opened inside the AURIX™ Development Studio using the following icon:



- > The serial monitor must be configured with the following parameters to enable the communication between the board and the PC:

- Speed (baud): 115200
- Data bits: 8
- Stop bit: 1



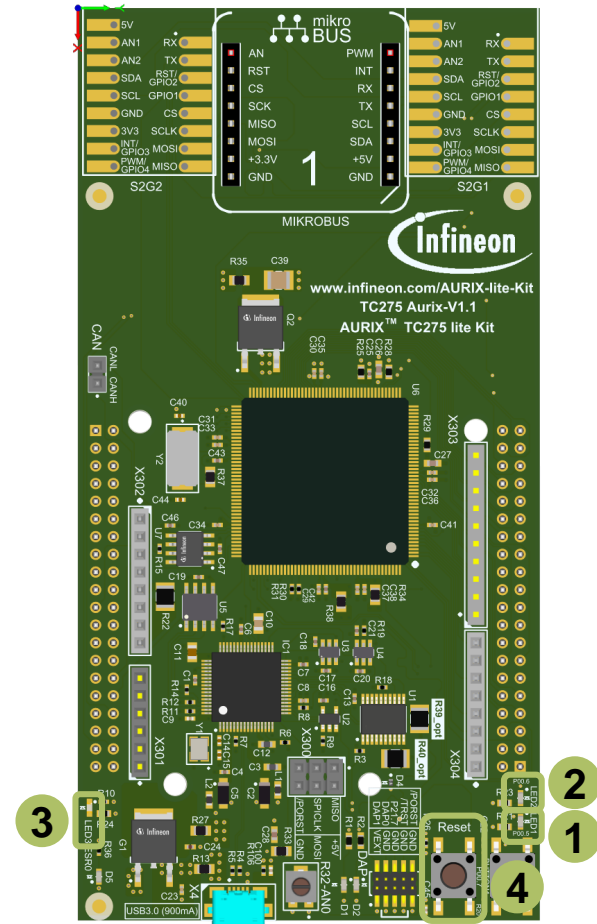
# Run and Test

After code compilation and flashing the device, observe the **LED1**, **LED2** and **LED3** behavior.

## Stepping in Standby:

- > LED1 **1** is ON immediately after reset
- > Approximately after four seconds, LED2 **2** turns on to signal that in one second Standby mode is going to be entered
- > In Standby mode, all LEDs are off as all ports are set in their reset state. The LED3 **3** turns on signaling Standby mode entered as the ESR0 is configured as reset output and held low during Standby mode

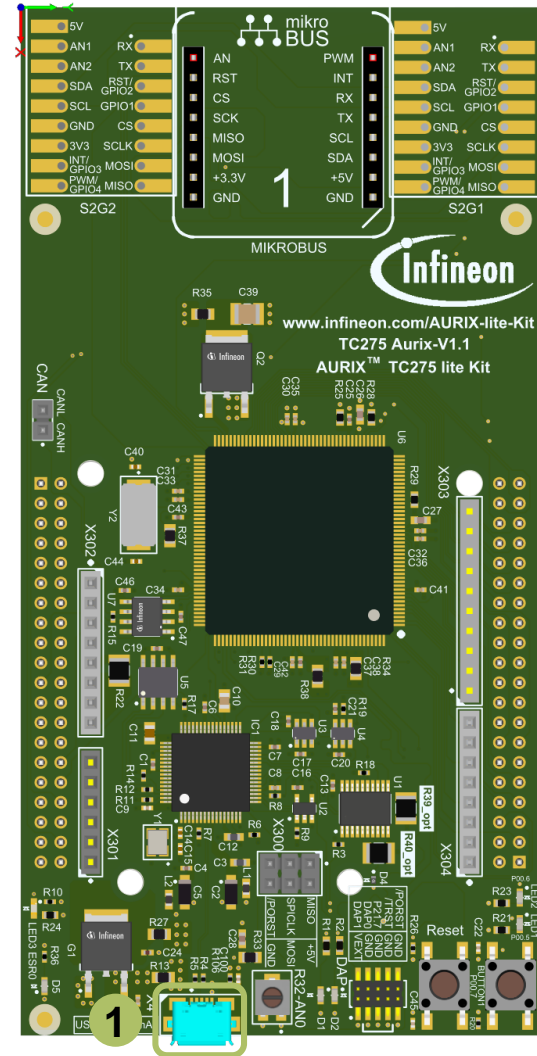
**Note:** 'Stepping in Standby' can be repeated by pressing PORST button. **4**



# Run and Test

## Returning from Standby:

- > The board must be connected to the PC through the USB port **1**
- > The configured Wake-Up trigger is PinA connected to port pin 14.1 and can be controlled using the terminal window
- > Open the terminal window and send anything out **2**
- > Observe that the microcontroller returns from Standby mode similar as it would start from a reset and the application code is executed again. Thus the application sends the microcontroller back into Standby mode





# 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:
- › <https://www.infineonforums.com/forums/13-Aurix-Forum>

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**Document reference**

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**\_KIT\_TC275\_LK**

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