

SMU_Reset_Alarm_1 for KIT_AURIX_TC375_LK

Reset triggered by an SMU alarm

AURIX™ TC3xx Microcontroller Training
V1.0.1



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Scope of work

The SMU triggers an alarm, which resets the device as preconfigured reaction.

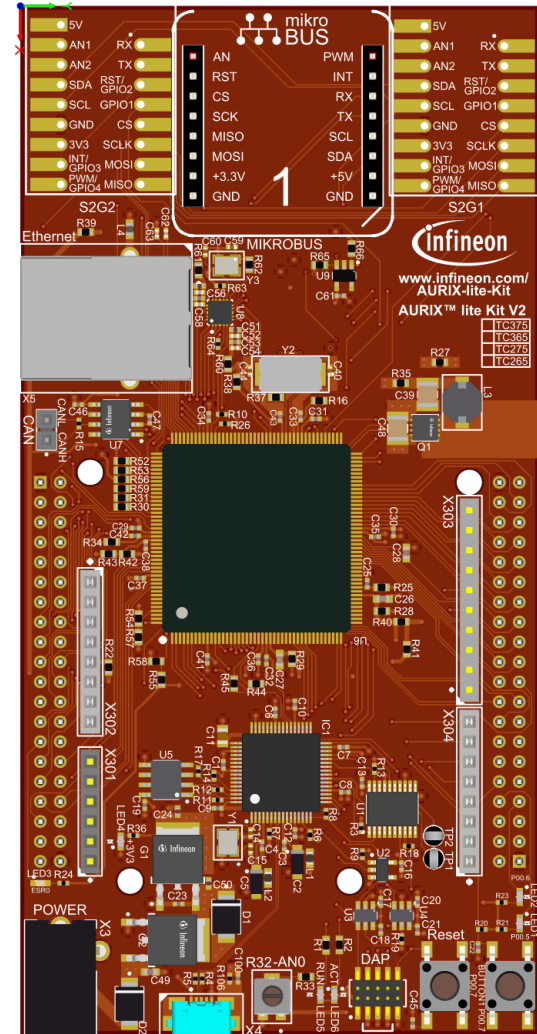
The Safety Management Unit (SMU) is configured to trigger a reset if an internal software alarm occurs.

Introduction

- › The Safety Memory Unit (SMU) is a central and modular component of the safety architecture providing a generic interface to manage the behavior of the microcontroller under the presence of faults
- › The SMU centralizes all the alarm signals related to the different hardware- and software-based safety mechanisms
- › Each alarm can be individually configured to trigger internal or external actions
- › The SMU in combination with the embedded safety mechanisms, is able to detect and report more than 99% of the critical failure modes
- › In this example, Software Alarm 0 is used to trigger a reset

Hardware setup

This code example has been developed for the board KIT_A2G_TC375_LITE.



Implementation

Configure the SMU module

- › To trigger a reset with an SMU alarm, a few steps are required:
 - The reset behavior is controlled by the reset configuration register of the System Control Unit (SCU). To modify this register, it is required to clear and set the Safety ENDINIT protection. This is done with the functions ***IfxScuWdt_clearSafetyEndinitInline()*** and ***IfxScuWdt_setSafetyEndinitInline()***
 - To enable the SMU reset, the SMU field of the Reset Configuration Register (**RSTCON**) has to be set to 0x1 for a system reset or 0x2 for an application reset (***SCU_RSTCON.B.SMU = 0x1***)
 - To modify the SMU registers, the SMU module has to be unlocked with the function ***IfxSmu_unlockConfigRegisters()***. After modification, the SMU registers have to be locked again using the function ***IfxSmu_lockConfigRegisters()***

Implementation

Configure the SMU module (cont.)

- The function ***IfxSmu_setAlarmAction()*** configures the alarm's behavior by writing a 3-bit code to the three Alarm Configuration Registers associated to the specific alarm and its group. In this example, the software alarm 0 (***IfxSmu_Alarm_Software_Alarm0***) and the SCU reset (***IfxSmu_InternalAlarmAction_reset***) are selected. The iLLD function itself selects the group based on the above mentioned parameters
- Start the SMU state machine (SSM) with the function ***IfxSmu_activateRunState()***

The functions above are provided by the iLLD headers ***IfxSmu.h*** and ***IfxSrc.h***.

Triggering of the alarm

- › The Software Alarm 0 can be triggered with the function ***IfxSmu_setAlarmStatus()*** provided by the iLLD header ***IfxSmu.h***

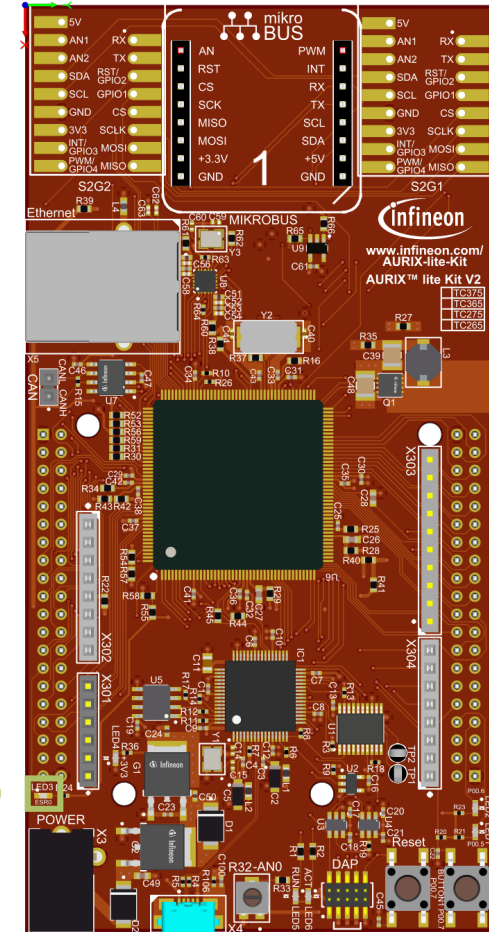
Run and Test

After code compilation and flashing the device, check if LED3 (1) is turned on.

Note: If the debugger is disconnected, the LED3 will blink very fast (continuous reset).

In the case the debugger is connected, the LED3 will blink once, due to the fact that after the reset the connection to the board was re-established.

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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>

Revision history

Revision	Description of change
V1.0.1	Improved description in implementation slides
V1.0.0	Initial version

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