

SCU_Reset_Detection_1

for KIT_AURIX_TC397_TFT

Detection of reset type

AURIX™ TC3xx Microcontroller Training
V1.0.0



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Scope of work

This example shows how to detect the source of the last reset (power-on reset, watchdog reset, etc.)

The AURIX™ TC3xx devices can be reset by various reset sources. The application software is able to determine the source of the last reset based on a routine that evaluates the related reset special function register. According to the type of reset, one of three LEDs is switched on.

Introduction

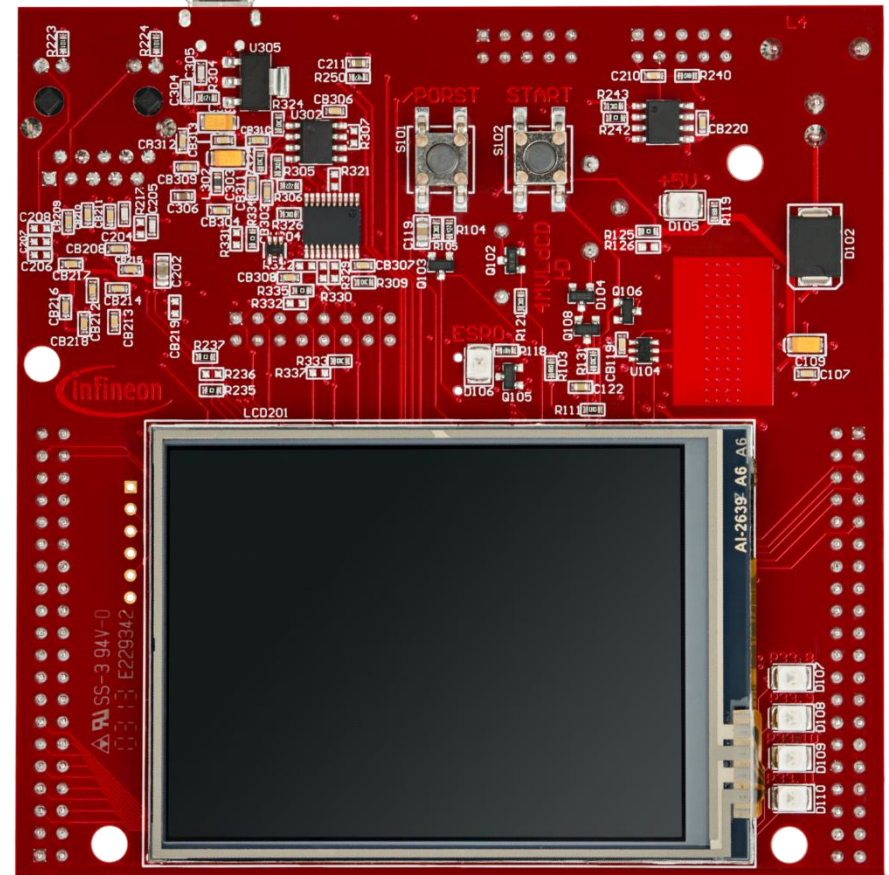
- › Resets can be configured and determined in the Reset Control Unit (RCU), belonging to the System Control Unit (SCU)

- › Various reset triggers are available, such as:
 - Supply Monitor
 - Embedded Voltage Regulators (EVRs)
 - Power-On Reset (PORST)
 - External Service Request (ESRx)
 - Debug interface

- › Consequently, different reset types can be derived, such as:
 - Cold-/Warm-Power-On Reset
 - System Reset
 - Application Reset
 - Debug Reset
 - Module Reset

Hardware setup

This code example has been developed for the board
KIT_A2G_TC397_5V_TFT.



Implementation

Reset Detection

To get information about the last occurred reset, the function ***IfxScuRcu_evaluateReset()*** is called inside ***detectResetSource()***. The returned value is a data structure comprising elements such as ***resetType*** and ***resetTrigger***.

- › The ***resetType*** specifies the type of the last reset (e.g. Cold Power-On Reset, System Reset, Application Reset or Warm Power-On Reset)
- › The ***resetTrigger*** specifies the source of the last reset. For instance, the source can be a Power-On Reset (pressing the PORST-Button), a SW triggered reset or a reset triggered by the debugger or any voltage supervision monitor

The function ***IfxScuRcu_evaluateReset()*** evaluates both the ***RSTSTAT*** and ***RSTCON*** registers

- › The ***RSTSTAT*** register is evaluated with regard to which reset bits are set, respectively, cleared. Firstly, the warm reset status bits comprising ***ESRx***, ***SMU***, ***SW***, ***STMx*** and ***CBx*** are evaluated. Secondly, the cold reset status bits comprising ***EVRC***, ***EVR33***, ***SWD*** and ***STBYR*** are evaluated if none of the warm reset status bits are set. Finally, the ***PORST*** bit is evaluated
- › The ***RSTCON*** register is evaluated to determine the type of reset based on the trigger configuration

Implementation

Reset Detection (cont.)

Based on the ***resetType*** of the ***lastReset***, LED D107, LED D108 or LED D109 is switched on.

Furthermore, the function ***detectResetSource()*** clears the Cold Power-On sticky bits using the function ***IfxScuRcu_clearColdResetStatus()***. Those bits are not cleared automatically and must be explicitly cleared by the application.

The functions ***IfxScuRcu_evaluateReset()*** and ***IfxScuRcu_clearColdResetStatus()*** can be found in the iLLD header ***IfxScuRcu.h***.

Implementation

Reset Trigger

The function ***triggerSwReset()*** triggers either a software Application Reset or a software System Reset, depending on the macro ***RESET_SRC*** given as parameter.

To trigger a software reset, the request trigger in the Reset Configuration Register must be configured first. This is done through the function ***IfxScuRcu_configureResetRequestTrigger()***.

Then, the CPU EndInit protection is cleared with the function ***IfxScuWdt_clearCpuEndinit()*** and the software reset is triggered calling ***IfxCpu_triggerSwReset()***.

Finally, the CPU EndInit protection should be set again, but this instruction cannot be reached since a software reset is triggered right before.

The function ***IfxScuRcu_configureResetRequestTrigger()*** can be found in the iLLD header ***IfxScuRcu.h***.

The function ***IfxScuWdt_clearCpuEndinit()*** can be found in the iLLD header ***IfxScuWdt.h***.

The function ***IfxCpu_triggerSwReset()*** can be found in the iLLD header ***IfxCpu.h***.

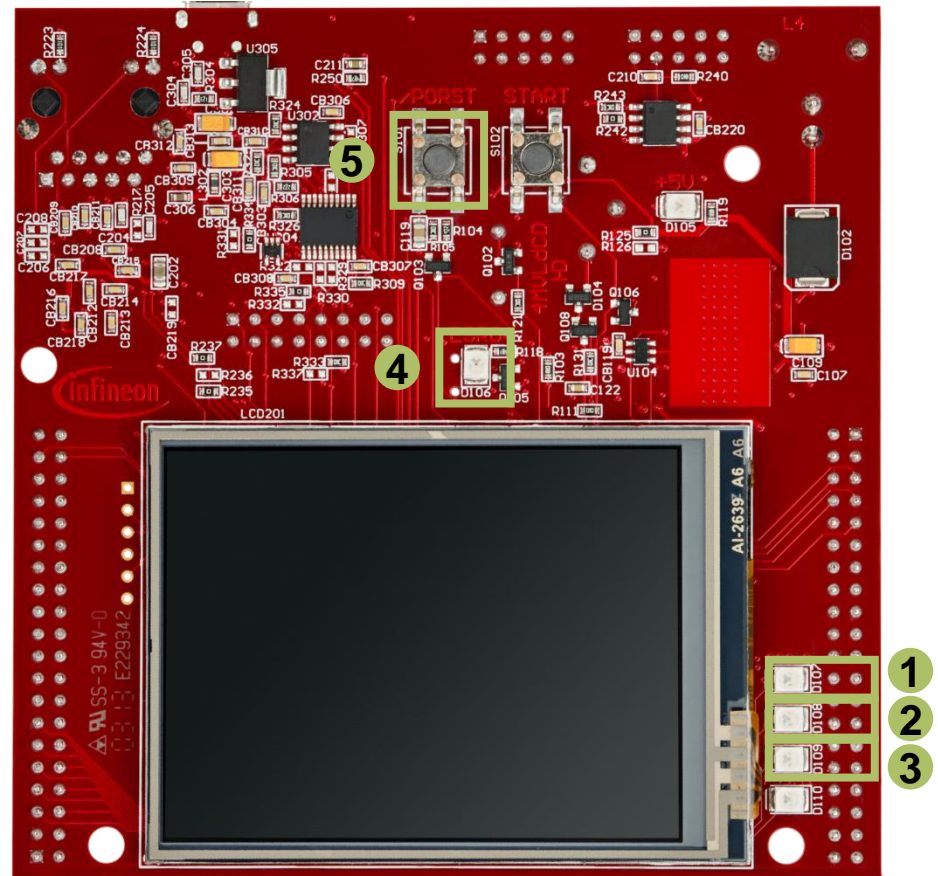
Run and Test

After code compilation and flashing the device, press the PORST button (5) and observe the following behavior:

- > The LED D109 (3) is turned on for 500 ms because a Warm Power On reset is detected
- > Then, the board is reset by software, therefore the LED D106 (4) is blinked once
- > Finally, depending on the last occurred reset (given by the **RESET_SRC** macro) the LED D107 (1) or the LED D108 (2) is turned on

The **RESET_SRC** is firstly set to **APPLICATION_RESET**. To trigger a system reset, change the macro to **SYSTEM_RESET**, re-flash the code, press the PORST button (5) and check that LED D108 (2) is switched on after LED D109 (3).

Note: To observe the correct behavior of this example, use the “Flash current project” button. This ensures that the project is flashed on the board without triggering the debugger.



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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Email: erratum@infineon.com

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