SCU_Reset_Detection_1
for KIT_AURIX_TC297_TFT
Detection of reset type
Scope of work

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

The AURIX™ TC2xx 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)

- There are various reset triggers such as SupplyMonitor, EVRs, PORST, ESRx, JTAG

- 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_AURIX_TC297_TFT_BC-Step.
Implementation

Reset Detection

To get information about the last occurred reset, the function `evaluateReset()` is called inside `detectResetSource()`. The returned value is a data structure defined in `SCU_Reset_Detection.h` comprising two elements: `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 `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 `EVR13`, `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

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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 `clearColdPowerOnResetBits()`. Those bits are not cleared automatically and must be explicitly cleared by the application.

The functions `evaluateReset()` and `clearColdPowerOnResetBits()` can be found in the `SCU_Reset_Detection.h` header file.
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 `configureSwResetRequestTrigger()`, that sets the SW bitfield of the RSTCON register accordingly to the given parameter.

Then, the Safety EndInit protection is cleared with the function `IfxScuWdt_clearSafetyEndinit()` and the software reset is triggered calling `IfxCpu_triggerSwReset()`.

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

The function `configureSwResetRequestTrigger()` can be found in the `SCU_Reset_Detection.h` header file.
The function `IfxScuWdt_clearSafetyEndinit()` 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 \texttt{RESET\_SRC} macro) the LED D107 (1) or the LED D108 (2) is turned on

The \texttt{RESET\_SRC} is firstly set to \texttt{APPLICATION\_RESET}. To trigger a system reset, change the macro to \texttt{SYSTEM\_RESET}, re-flash the code, press the PORST button (5) and check that LED D108 (2) is switched on after LED D109 (3).

\textbf{Note:} To observe the correct behavior of this example, use the Flash 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
## Revision history

<table>
<thead>
<tr>
<th>Revision</th>
<th>Description of change</th>
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<tbody>
<tr>
<td>V1.1.0</td>
<td>Training reworked. Detection of resets is shown with LEDs</td>
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<tr>
<td>V1.0.1</td>
<td>Update of version to be in line with the code example’s version</td>
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<tr>
<td>V1.0.0</td>
<td>Initial version</td>
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