SCU_Reset_Detection_1
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.
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

**startScuResetDetection()**

- This function executes the `evaluateReset()` function, which provides information about the last occurred reset. 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. a 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 PORST-Button), a SW triggered reset or a reset triggered by debugger or any voltage supervision monitor.

- Furthermore, the function `evaluateReset()` 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 local variable `swReset` can be used to specify the type of SW-Reset initiated by the function `triggerSWReset()`.
Implementation

evaluateReset()

- The function `evaluateReset()` evaluates both the `SCU.RCU.RSTSTAT` and `SCU.RCU.RSTCON` registers.

- The `SCU.RCU.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 `SCU.RCU.RSTCON` is evaluated to determine the type of reset, specified for the warm reset status bits, except debugger related reset sources.

triggerSWReset()

- This function was developed only for testing purposes. Based on the local variable `swReset`, it triggers either a SW Application Reset or a SW System Reset.
Run and Test

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

1. Run the code
2. Suspend the code execution
3. Watch the local structure variable `lastReset` (the elements `lastReset.resetType` and `lastReset.resetTrigger`)
4. Check whether the `lastReset.resetType` is set to 'application' reset and whether the `lastReset.resetTrigger` is set to 'cb3'.
5. Press button 'PORST'

6. Perform steps 1. through 3.
7. Check whether the `lastReset.resetType` is set to 'warmpoweron' reset and whether the `lastReset.resetTrigger` is set to 'porst'.
Run and Test

8. Set the local variable `swReset` to '1'
9. Perform steps 1. through 3.
10. Check whether the `lastReset.resetType` is set to 'application' reset and whether the `lastReset.resetTrigger` is set to 'sw'.
11. Set the local variable `swReset` to '2'
12. Perform steps 1. through 3.
13. Check whether the `lastReset.resetType` is set to 'system' reset and whether the `lastReset.resetTrigger` is set to 'sw'.
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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