

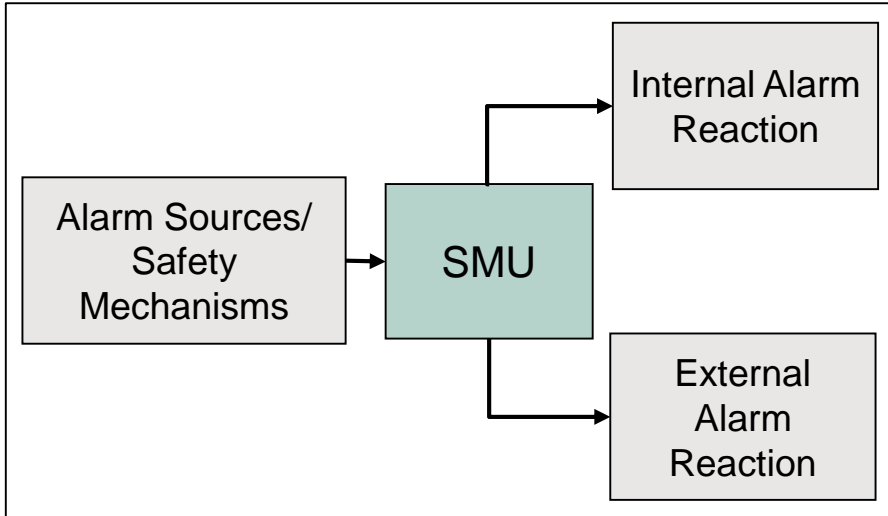
SMU

Safety Management Unit

AURIX™ TC2xx Microcontroller Training
V1.0 2019-03



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Highlights

The Safety Management Unit (SMU) is a central hardware module that collects the alarms from every hardware safety mechanisms, as well as the error signals related to the architecture.

The severity of each alarm can be configured accordingly with the needs of the application.

Key Features

Unified fault management

Recovery timers

Customer Benefits

- › Configurable internal and/or external reaction for each individual alarm
- › Enables monitoring of duration of internal error handlers

Unified fault management

- › With the SMU, pre-defined reaction can be configured individually for each alarm
- › Whenever an input alarm event is detected and the SMU state machine is in the RUN or FAULT state, the module checks what are the configured actions to be done

External reaction

- Use **Fault Signaling Protocol** to transition from “fault free state” to “fault state”
- Request **Emergency Stop** to set selected pins in reset state

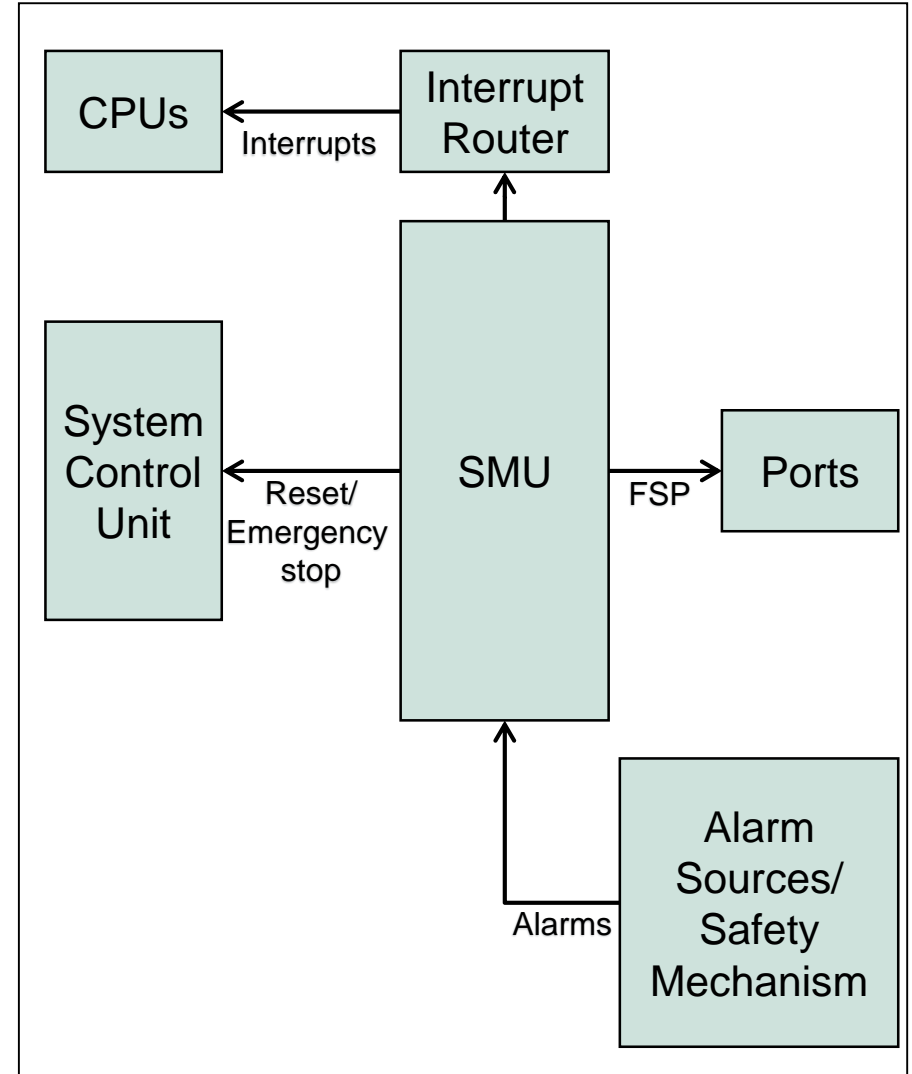
Internal reaction

- Issue **Non Maskable Interrupt** to all CPUs
- Issue **interrupt** to a configurable set of CPUs
- Issue an **application** or **system reset**
- Issue a **CPU reset** selectively

Recovery timer

- › Recovery timers (RTs) are available to enable monitoring of the duration of internal error handlers
- › The recovery timer duration can be configured
- › If a recovery timer is enabled and any of the configured alarm events occurs, the recovery timer is automatically started by hardware
- › Once a recovery timer event occurs, the recovery timer starts and counts until software stops it
- › If the timer expires, an internal SMU alarm (Recovery Timer Timeout) is issued

- > The SMU is connected to all safety mechanisms that are within the microcontroller
- > It is also connected to the System Control Unit, the Interrupt Router and the Ports in order to trigger the configured reaction when an alarm is set

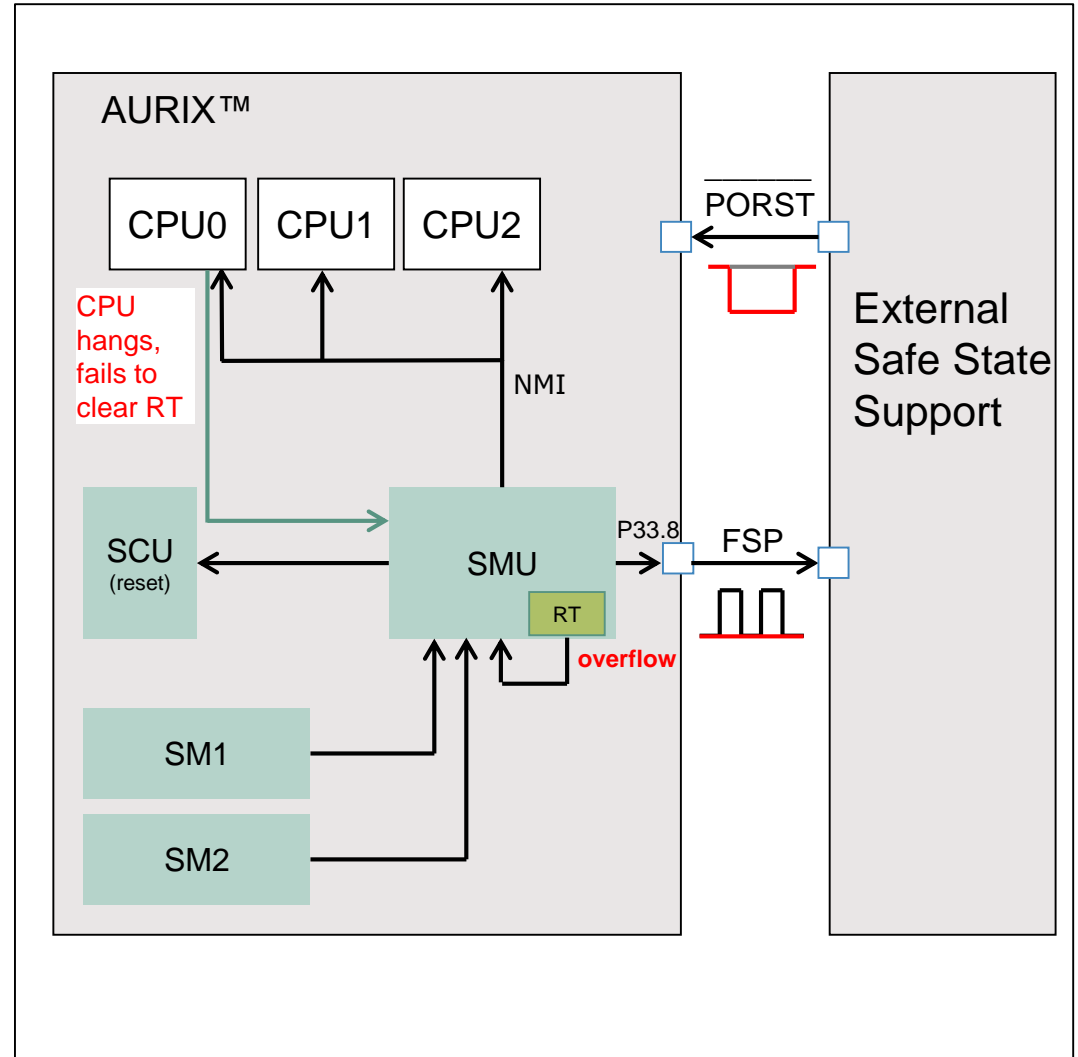


Overview

- > Description of issue: An alarm is triggered by a safety mechanism (SM)
- > Procedure: SMU triggers a NMI and starts the recovery timer

Advantages

- > Granular reaction concept
- > Direct connection to external world via FSP Pin
- > Possibility to recover from alarm via RT



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