Freescale MQX RTOS Example Guide

ISR example

This document explains the ISR example, what to expect from the example and a brief introduction to the API used.

The example

The example demonstrates the usage of interrupts in MQX with the function _int_install_isr() and function _int_install_kernel_isr(). The MQX RTOS manages user interrupt service routine (ISR) in a separate table from the vector table. The function _int_install_isr() allows user to insert whatever ISR to MQX interrupt table to handle interrupt without defecting the application. Whereas function _int_install_kernel_isr() change the ISR for any interrupt in the vector table. As a result a very carefully designed ISR must be used with this function. The ISR installed directly into vector table must only perform simple operation like arithmetic operation or it may ruin the application as no context saving is done when interrupt happens.

This example also reveals another way to trigger interrupt in microcontroller which is by using the interrupt channel inside a NVIC of Cortex M. The I/O port PORTA interrupt is triggered by software using special feature of NVIC module without any external triggering source.

Two interrupt

Running the example

The user only needs to do compilation of MQX libraries, ksdk library and the example without any further step.

To run the example the corresponding IDE, compiler, debugger and a terminal program are needed.

Explaining the example

The application example creates a task named main_task. The task main_task does following jobs.

- Install one ISR for PORTA interrupt using function _int_install_isr(). This ISR adds 1 to a count variable of a global structure variable every time the PORTA interrupt occurs.

- Install another ISR for PORTA interrupt using function _int_install_kernel_isr(). This ISR however adds 1 to a global count variable.
- The PORTA interrupt is triggered every 10 ms by pending the interrupt channel of PORTA interrupt channel within NVIC structure. The values of two count variables are displayed over output terminal.
- Restore the system to previous state before changing ISR of PORTA interrupt and terminate the application.

The following output is shown when example finishes.