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IEC60730B CM33 4.0

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1 Introduction

IEC60730B_CM33_4_0 is the actual version of the core self-test library for NXP devices with the CM33 core. The library is certified by VDE. It is dedicated for use in applications compliant with the Safety class B standard (specified by IEC 60730, IEC60335 and/or UL 60730, and UL 1998).

The library is released in a precompiled format, together with functional example projects and documentation describing the respective tests.

The library is created in close cooperation with the application team, who have vast experience in customer projects. We also take the feedback from our customers into consideration.

2 What is new

This version is based on the CM4_CM7 library.

When compared to the previous version its predecessor, the main changes are:

- Functional examples are now available only in the MCUXpresso SDK as middleware packages.
- Changed/simplified the API of the test routines

2.1 Description

The supported devices are:

- LPC55Sxx

The supported/recommended IDEs:

- IAR v8.40 and higher
- Keil µVision V5.28 (C compiler V6) and higher
- MCUXpresso IDE V11.1 and higher

The tested components are:

- CPU registers
- Program counter
- Variable memory (RAM)
- Invariable memory (flash)
- Clock
- Digital I/O
- Analog I/O
- Stack

- Watchdog

3 Optimizations, improvements and changes:

3.1 Library

Changed the names of functions, input parameters, macros, and variables.

The tests that are not related to to core and memory were unified across the devices with Arm cores.

The CPU tests are adapted to the trusted-zone support.

The new functions are:

- CPU:
  - FS_CM33_CPU_SPmain_S()
  - FS_CM33_CPU_SPmain_NS()
  - FS_CM33_CPU_SPmain_Limit_S()
  - FS_CM33_CPU_SPmain_Limit_NS()
  - FS_CM33_CPU_SPprocess_S()
  - FS_CM33_CPU_SPprocess_NS()
  - FS_CM33_CPU_SPprocess_Limit_S()
  - FS_CM33_CPU_SPprocess_Limit_NS()
  - FS_CM33_CPU_Control_S()
  - FS_CM33_CPU_Control_NS()
  - FS_CM33_CPU_Special8PriorityLevels_S()
  - FS_CM33_CPU_Special8PriorityLevels_NS()

The new functions due to the LPCs peripherals:

- Clock test:
  - FS_CLK_CTIMER_LPC()
- Flash test:
  - FS_CM33_FLASH_HW16()
  - FS_CM33_FLASH_HW32()
- Digital I/O test:
  - FS_DIO_Output_LPC()
  - FS_DIO_InputExt_LPC()
  - FS_DIO_ShortToSupplySet_LPC()
  - FS_DIO_ShortToAdjSet_LPC()
- Analog I/O test:
  - FS_AIO_InputInit_LPC_ADC16()
  - FS_AIO_InputTrigger()
  - FS_AIO_InputSet_LPC55SXX()
  - FS_AIO_InputCheck_LPC55SXX()

- Watchdog test:
  - FS_WDOG_Setup_WWDT_LPC()
  - FS_WDOG_Check_WWDT_LPC55SXX()

3.2 Documentation

The documents for all test routines are merged into one document.

3.3 Examples

The example projects are available only in the MCUXpresso SDK as middleware.

To open an example:

- Go to http://mcuxpresso.nxp.com.
- Click Select Development Board.
- Select the supported board and click to add the Safety middleware.
- Perform the SDK package build and download.

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