

MCUXSDKIMX8ULPRN

MCUXpresso SDK Release Notes for EVK-MIMX8ULP and EVK9-MIMX8ULP

Rev. 4 — 1 July 2024

Release notes

Document information

| Information | Content |
|-------------|---|
| Keywords | EVK-MIMX8ULP, EVK9-MIMX8ULP, 8ULP, MIMX8ULP |
| Abstract | This document describes the MCUXpresso SDK release notes for EVKMIMX8ULP and EVK9-MIMX8ULP. |



1 Overview

The MCUXpresso Software Development Kit (SDK) is a collection of software enablement for microcontrollers that includes peripheral drivers, high-level stacks including other middleware packages. In addition to the base enablement, the MCUXpresso SDK is augmented with demo applications, driver example projects, and API documentation to help the customers quickly leverage the support of the MCUXpresso SDK. For details on MCUXpresso SDK, see [MCUXpresso-SDK: Software Development Kit for MCUXpresso](#).

2 MCUXpresso SDK

As part of the MCUXpresso software and tools, MCUXpresso SDK is the evolution of Kinetis SDK v2.10.0, includes support for LPC, DSC, and i.MX System-on-Chip (SoC). The same drivers, APIs, and middleware are still available with support for Kinetis, LPC, DSC, and i.MX silicon. The MCUXpresso SDK adds support for the MCUXpresso IDE, an Eclipse-based toolchain that works with all MCUXpresso SDKs. Easily import your SDK into the new toolchain to access all of the available components, examples, and demos for your target silicon. In addition to the MCUXpresso IDE, support for the MCUXpresso Config Tools allows easy cloning of existing SDK examples and demos, allowing users to leverage the existing software examples provided by the SDK for their own projects.

In order to maintain compatibility with legacy Freescale code, the filenames and source code in MCUXpresso SDK containing the legacy Freescale prefix FSL have been left as is. The FSL prefix has been redefined as the NXP Foundation Software Library.

3 Development tools

The MCUXpresso SDK is compiled and tested with these development tools:

- GCC Arm Embedded, version is 10-2021.10.
- IAR Embedded Workbench for Arm, version is 9.32.1.

4 Supported development systems

This release supports boards and devices listed in table below. The boards and devices in bold were tested in this release.

Table 1. Supported boards and devices

| Development boards | MCU devices |
|--------------------|-----------------|
| EVK-MIMX8ULP | MIMX8UD7DVP10SA |
| EVK9-MIMX8ULP | MIMX8UD5DVK10SA |

5 MCUXpresso SDK release package

The MCUXpresso DSC SDK release package content is aligned with the silicon subfamily it supports. This includes the boards, devices, documentation, and middleware.

5.1 Device support

The device folder contains the whole software enablement available for the specific System-on-Chip (SoC) subfamily. This folder includes clock-specific implementation, device register header files, device register feature header files, and the system configuration source files. Included with the standard SoC support are

folders containing peripheral drivers, toolchain support, and a standard debug console. The device-specific header files provide a direct access to the microcontroller peripheral registers. The device header file provides an overall SoC memory mapped register definition. The folder also includes the feature header file for each peripheral on the microcontroller. The toolchain folder contains the startup code and linker files for each supported toolchain. The startup code efficiently transfers the code execution to the main() function.

5.1.1 Board support

The boards folder provides the board-specific demo applications, driver examples, and middleware examples.

5.1.2 Demo application and other examples

The demo applications demonstrate the usage of the peripheral drivers to achieve a system level solution. Each demo application contains a readme file that describes the operation of the demo and required setup steps. The driver examples demonstrate the capabilities of the peripheral drivers. Each example implements a common use case to help demonstrate the driver functionality.

5.2 CMSIS DSP Lib

5.2.1 CMSIS DSP Library

The MCUXpresso SDK is shipped with the standard CMSIS development pack, including the prebuilt libraries.

5.3 Operating system

5.3.1 FreeRTOS

The MCUXpresso SDK is integrated with FreeRTOS OS.

5.4 Middleware

5.4.1 Multicore

Multicore Software Development Kit

6 Release contents

[Table 2](#) provides an overview of the MCUXpresso SDK release package contents and locations.

Table 2. MCUXpresso SDK release package contents and locations

| Deliverable | Location |
|--|--|
| Boards | INSTALL_DIR/boards |
| Demo Applications | INSTALL_DIR/boards/<board_name>/demo_apps |
| Driver Examples | INSTALL_DIR/boards/<board_name>/driver_examples |
| Driver, SoC header files, extension header files and feature header files, utilities | INSTALL_DIR/devices/<device_name> |
| CMSIS drivers | INSTALL_DIR/devices/<device_name>/cmsis_drivers |
| Peripheral drivers | INSTALL_DIR/devices/<device_name>/drivers |
| Toolchain linker files and startup code | INSTALL_DIR/devices/<device_name>/<toolchain_name> |

Table 2. MCUXpresso SDK release package contents and locations...continued

| Deliverable | Location |
|---|---|
| Utilities such as debug console | INSTALL_DIR/devices/<device_name>/utilities |
| CMSIS Arm Cortex-M header files, DSP library source | INSTALL_DIR/CMSIS |
| Components and board device drivers | INSTALL_DIR/components |
| Documents | INSTALL_DIR/docs |
| RTOS | INSTALL_DIR/rtos |
| Release Notes, Getting Started Document and other documents | INSTALL_DIR/docs |
| Tools such as shared cmake files | INSTALL_DIR/tools |

7 MISRA compliance

All MCUXpresso SDK drivers comply to MISRA 2012 rules with exceptions in [Table 3](#).

Table 3. MISRA exception rules

| Exception rules | Description |
|-----------------|---|
| Directive 4.4 | Sections of code should not be commented out. |
| Directive 4.5 | Identifiers in the same namespace with overlapping visibility should be typographically unambiguous. |
| Directive 4.6 | Typedefs that indicate size and signedness should be used in place of the basic numerical types. |
| Directive 4.8 | If a pointer to a structure or union is never dereferenced within a translation unit, then the implementation of the object should be hidden. |
| Directive 4.9 | A function should be used in preference to a function-like macro where they are interchangeable. |
| Directive 4.13 | Functions which are designed to provide operations on a resource should be called in an appropriate sequence. |
| Rule 1.2 | Language extensions should not be used. |
| Rule 2.3 | A project should not contain unused type declarations. |
| Rule 2.4 | A project should not contain unused tag declarations. |
| Rule 2.5 | A project should not contain unused macro declarations. |
| Rule 2.6 | A function should not contain unused label declarations. |
| Rule 2.7 | There should be no unused parameters in functions. |
| Rule 4.2 | Trigraphs should not be used. |
| Rule 5.1 | External identifiers shall be distinct. |
| Rule 5.4 | Macro identifiers shall be distinct. |
| Rule 5.9 | Identifiers that define objects or functions with internal linkage should be unique. |
| Rule 8.7 | Functions and objects should not be defined with external linkage if they are referenced in only one translation unit. |

Table 3. MISRA exception rules...continued

| Exception rules | Description |
|-----------------|---|
| Rule 8.9 | An object should be defined at block scope if its identifier only appears in a single function. |
| Rule 8.11 | When an array with external linkage is declared, its size should be explicitly specified. |
| Rule 8.13 | A pointer should point to a const-qualified type whenever possible. |
| Rule 10.5 | The value of an expression should not be cast to an inappropriate essential type. |
| Rule 11.4 | A conversion should not be performed between a pointer to object and an integer type. |
| Rule 11.5 | A conversion should not be performed from pointer to void into pointer to object. |
| Rule 12.1 | The precedence of operators within expressions should be made explicit. |
| Rule 12.3 | The comma operator should not be used. |
| Rule 12.4 | Evaluation of constant expressions should not lead to unsigned integer wrap-around. |
| Rule 13.3 | A full expression containing an increment (++) or decrement (–) operator should have no other potential side effects other than that caused by the increment or decrement operator. |
| Rule 15.4 | There should be no more than one break or go to statement used to terminate any iteration statement. |
| Rule 17.5 | The function argument corresponding to a parameter declared to have an array type shall have an appropriate number of elements. |
| Rule 17.8 | A function parameter should not be modified. |
| Rule 19.2 | The union keyword should not be used. |
| Rule 20.1 | #include directives should only be preceded by preprocessor directives or comments. |
| Rule 20.10 | The # and ## preprocessor operators should not be used. |
| Rule 21.1 | #define and #undef shall not be used on a reserved identifier or reserved macro name. |
| Rule 21.2 | A reserved identifier or macro name shall not be declared. |
| Rule 21.12 | The exception handling features of <fenv.h> should not be used. |

8 Known issues

This section lists the known issues, limitations, and/or workarounds.

8.1 Maximum file path length in Windows 7 operating system

The Windows 7 operating system imposes a 260-character maximum length for file paths. When installing the MCUXpresso SDK, place it in a directory close to the root to prevent file paths from exceeding the maximum character length specified by the Windows operating system. The recommended location is the C:\<folder>.

8.2 Fusion DSP may load wrong data from shared SRAM on Silicon A0.1 with specific command sequence

There is issue in the shared SRAM controller prefetch logic for silicon A0.1.

A back-2-back access to the same memory location without any “nop” cycle in between corrupts the prefetch buffer under the following conditions.

First cycle access is a read to address N, immediately followed by the second cycle-partial write (1 byte or halfword (16-bits)) to address N.

The partial write is not updated to prefetch buffer. Subsequent reading from the Shared SRAM address N returns incorrect data.

8.3 Real-Time Domain cannot normally resume from the power-down mode due to EdgeLock secure enclave (S400) failure

There is an issue in EdgeLock secure enclave (S400) during state restoring phase for silicon A0.1. When Real Time Domain (RTD) is about to enter the power-down mode, S400 is promoted to save the current state to the memory. However, once RTD wakes up, S400 encounters an error when trying to restore the state.

This error can cause S400 decide to reset RTD, which means RTD cannot normally resume from the power-down mode.

8.4 Flexcan_ping_pong_buffer_transfer case loses first 8 bytes data for armgcc flash_debug

To prevent flexcan_ping_pong_buffer_transfer case from losing the first 8 bytes data for armgcc flash_debug, apply the fix below.

```
a/flexcan/example/ping_pong_buffer_transfer/flexcan_ping_pong_buffer_transfer.c
+++ b/flexcan/example/ping_pong_buffer_transfer/
flexcan_ping_pong_buffer_transfer.c
@@ -539,10 +539,11 @@ int main(void)
     else
     {
         /* Wait until Rx queue 1 full. */
-        while (rxQueueNum != 1U)
+        while (rxQueueNum == 0U)
         {
         };
-        rxQueueNum = 0;
+        if (rxQueueNum == 1)
+            rxQueueNum = 0;
         LOG_INFO("Read Rx MB from Queue 1.\r\n");
         for (i = 0; i < RX_QUEUE_BUFFER_SIZE; i++)
         {
```

8.5 Lpspi_interrupt_b2b_master/slave example transfer fail on iar/armgcc flash target

The lpspi_interrupt_b2b_master/slave example transfer fails to send the data from the master to the slave on iar/armgcc flash target.

8.6 DSP examples build failure in IAR 9.50.1

In IAR version 9.50.1, there are build issues when building dsp_examples. To build the dsp_examples, use an older version of IAR. This issue will be fixed in the next version of IAR tool.

8.7 DSP examples cannot boot the Fusion core

The examples in the dsp_examples folder can not run properly since they can not boot the Fusion DSP core. It can be fixed by removing line 633 from board.c: `TRDC_MbcSetMemoryBlockConfig (TRDC, &mbcBlockConfig);` under comment `/* non secure state can access CGC0 (Pbridge0, slot 47) for HIFI4 DSP */`. This will be fixed in the next release.

For the dsp_voice_spot_demo there is a wrong incbin.S file used. Please use the same file as for the rest of the DSP examples.

9 Change log

Change log of software components included in the package, see MCUXpresso SDK ChangeLog_MIMX8ULP.pdf.

10 Revision history

[Table 4](#) below summarizes the revisions to this document.

Table 4. Revision history

| Revision number | Date | Substantive changes |
|-----------------|-------------------|--|
| 4 | 01 July 2024 | Added Section 8.7 "DSP examples cannot boot the Fusion core" to the Section 8 "Known issues" . |
| 3 | 11 January 2024 | Added Section 8.6 "DSP examples build failure in IAR 9.50.1" to the Section 8 "Known issues" . |
| 2 | 01 September 2023 | Updated Section 8 "Known issues" . |
| 1 | 20 June 2023 | Initial public release |

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