

MCUXSDKMIMXRT118XKRN

MCUXpresso SDK Release Notes for MIMXRT1180-EVK

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Release notes

Document information

Information	Content
Keywords	MCUXSDKMIMXRT118XKRN, Release Notes, MIMXRT1180-EVK
Abstract	This document describes the MCUXpresso SDK release notes for MIMXRT1180-EVK.



1 Overview

The MCUXpresso SDK is a comprehensive software enablement package designed to simplify and accelerate application development with Arm Cortex-M-based devices from NXP, including its general purpose, crossover and Bluetooth-enabled MCUs.

MCUXpresso SW and Tools further extend the SDK support to the i.MX counterparts. The MCUXpresso SDK includes production-grade software with integrated RTOS (optional), integrated enabling software technologies (stacks and middleware), reference software, and more.

In addition to working seamlessly with the MCUXpresso IDE, the MCUXpresso SDK also supports and provides example projects for IAR, KEIL, and GCC with Cmake. 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.

Underscoring our commitment to high quality, the MCUXpresso SDK is MISRA compliant and checked with Coverity static analysis tools. 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, 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 to 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 has 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, and the version is 12.3.1.
- IAR Embedded Workbench for Arm, and the version is 9.50.2.
- MCUXpresso IDE, and the version is 11.10.0.
- Keil MDK, and the version is 5.38.

Note:

- *Segger JLink software is also needed for debugging via the JLink debug interface. The lowest required version is 7.94g.*
- *IAR will release the service pack in Q1, 2024, which will provide an out of box support for RT1180. Contact NXP for a supporting patch, if you are using 9.50.1.*

4 Supported development system

[Table 1](#) lists boards and devices supported in this release. The boards and devices in bold were tested in this release.

Table 1. Supported boards and devices

Development boards	MCU devices
MIMXRT1180-EVK	MIMXRT1189CVM8B , MIMXRT1189XVM8B, MIMXRT1187CVM8B, MIMXRT1187XVM8B, MIMXRT1182CVP2B, MIMXRT1182XVP2B, MIMXRT1181CVP2B, MIMXRT1181XVP2B

5 MCUXpresso SDK release package

The MCUXpresso 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.

5.2 Board support

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

5.3 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.

6 Middleware

6.1 aws_iot

Amazon Web Service (AWS) IoT Core SDK

6.2 Dhara

Dhara is a small flash translation layer designed for use in resource-constrained systems for managing NAND flash.

6.3 edgefast_bluetooth

EdgeFast Protocol Abstraction Layer

6.4 elQ

elQ machine learning SDK containing:

- Arm CMSIS-NN library (neural network kernels optimized for Cortex-M cores)
- Inference engines:
 - TensorFlow Lite Micro
- Example code for TensorFlow Lite Micro

6.5 fatfs

The FatFs file system is integrated with the MCUXpresso SDK and can be used to access either the SD card or the USB memory stick when the SD card driver or the USB Mass Storage Device class implementation is used.

6.6 freemaster

FreeMASTER communication driver for 32-bit platforms.

6.7 LittleFS

A little fail-safe filesystem (LittleFS) designed for microcontrollers.

6.8 llhttp

HTTP parser in LLVM IR

6.9 lwip

The lwIP TCP/IP stack is pre-integrated with MCUXpresso SDK and runs on top of the MCUXpresso SDK Ethernet driver with Ethernet-capable devices/boards.

6.10 mbedtls

mbedtls SSL/TLS library

6.11 mcu-boot

Software for Bootloaders,Flashloaders and host tools

6.12 mcuboot_opensource

A generic bootloader for microcontrollers

6.13 Motor Control Software (ACIM, BLDC, PMSM)

Motor control examples

6.14 multicore

Multicore Software Development Kit.

6.15 NXP Wi-Fi

The MCUXpresso SDK provides driver for NXP Wi-Fi external modules. The Wi-Fi driver is integrated with LWIP TCPIP stack and demonstrated with several network applications (iperf and AWS IoT).

For more information, see *Getting Started with NXP based Wireless Modules and i.MX RT Platform Running on RTOS* (document [UM11441](#))

6.16 pkcs11

Public Key Cryptography Standard #11 defines generic cryptographic token interface.

6.17 PSA Test Suite

Arm Platform Security Architecture (PSA) Test Suite.

6.18 rtcesl

Real-time control embedded software library.

6.19 sdmmc stack

The SDMMC software is integrated with MCUXpresso SDK to support SD/MMC/SDIO standard specification. This also includes a host adapter layer for bare-metal/RTOS applications.

6.20 Simple Open EtherCAT Master

Simple Open EtherCAT Master (SOEM) is an open source EtherCAT master stack that is used to write custom EtherCAT Master applications. For more information on how to use SOEM, see the *Getting Started with MCUXpresso SDK for SOEM* document.

6.21 TF-M

Trusted Firmware - M library.

6.22 TinyCBOR

Tiny Concise Binary Object Representation (CBOR) library.

6.23 USB Host, Device, OTG Stack

For more information, see *MCUXpresso SDK USB Stack User's Guide* (document MCUXSDKUSBSUG).

7 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
Board Project Template for MCUXpresso IDE NPW	INSTALL_DIR/boards/<board_name>/project_template
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>
Utilities such as debug console	INSTALL_DIR/devices/<device_name>/utilities
Device Project Template for MCUXpresso IDE NPW	INSTALL_DIR/devices/<device_name>/project_template
CMSIS Arm Cortex-M header files, DSP library source	INSTALL_DIR/CMSIS
Components and board device drivers	INSTALL_DIR/components
EdgeLock Enclave (ELE) firmware	INSTALL_DIR/firmware/edgelock
RTOS	INSTALL_DIR/rtos
Release Notes, Getting Started Document and other documents	INSTALL_DIR/docs
Tools such as shared cmake files	INSTALL_DIR/tools
Middleware	INSTALL_DIR/middleware

8 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 name space 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.
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.

Table 3. MISRA exception rules...continued

Exception rules	Description
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 19.2	The union keyword should not be used.
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.

9 Known issues

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

9.1 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>`.

9.2 Segger version

The lowest required J-Link version is v7.94g.

9.3 AWS examples are not fully tested

The examples under `boards/evkmimxrt1180/aws_examples` are not fully tested. The associated features and functionalities are only for the evaluation purpose. Full feature verification will be covered in a future release.

9.4 Missing fsl_cache when create new project with board or kit

When creating a new C/C++ project, if `evkmimxrt1180` or `evkmimxrt1180_om13790host` kit is selected, `fsl_cache` component gets missed and causes build failure. To avoid the build failure, manually select it in **SDK Wizard** page.

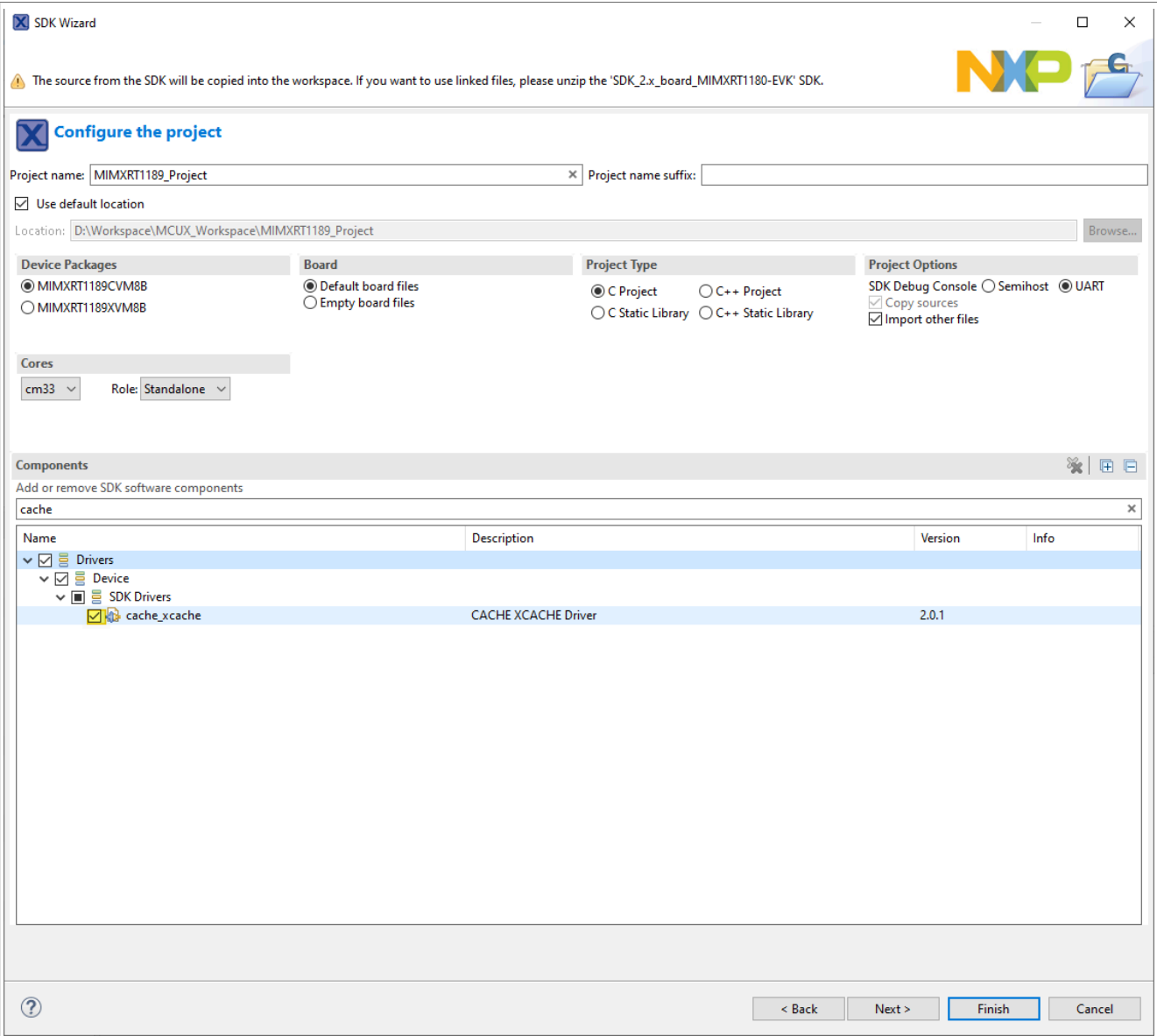


Figure 1. Manually select cache component in the SDK wizard

9.5 Misra/Coverity issues

There are several Misra/Coverity issues in the following source code, to be fixed in future releases.

Table 4. Misra issues

Source code location	Possible violation rule	Number of issues
devices/MIMXRT1189/drivers/fsl_tstmr.h	Rule 10.4	1
components/flash/nor/flexspi/fsl_flexspi_nor_flash.c	Rule 9.3	1
components/edgefast_wifi/source/wpl_nxp.c	Rule 10.3, 17.7, 21.6	10

Table 5. Coverity Issues

Source code location	Possible violation rule	Number of issues
middleware/mbedtls3x/port/ele_s4xx/src/opaque/mcux_psa_s4xx_opaque_asymmetric_signature.c	Uninitialized Variables	2
middleware/mbedtls/port/ele_s400/ecc_opaque/ecdsa_alt.c	Uninitialized Variables	2
middleware/wifi_nxp/wifidriver/mlan_glue.c	Memory - corruptions	1

Note: Related tickets are: MCUX-66358, MCUX-66527, MCUX-66528, MCUX-66529.

9.6 Debugging problems

When debugging `hyperram_txt_debug` or `hyperram_txt_release` target, user may encounter issue when debug with breakpoint. The reason is because code is cached. The default breakpoint type is auto/software breakpoint, it will lead soc core and debugger misaligned. As a workaround, please set breakpoint type to hardware breakpoint.

In addition, `hyperram_txt` targets can't debug on IAR versions: 9.50.1, 9.50.2, 9.60.1. The resolution is: delete the selected contents as shown in [Figure 2](#) in IAR path: `arm\config\flashloader\NXP\FlashIMXRT1180-EVK_FlexSPI_M33.board`.

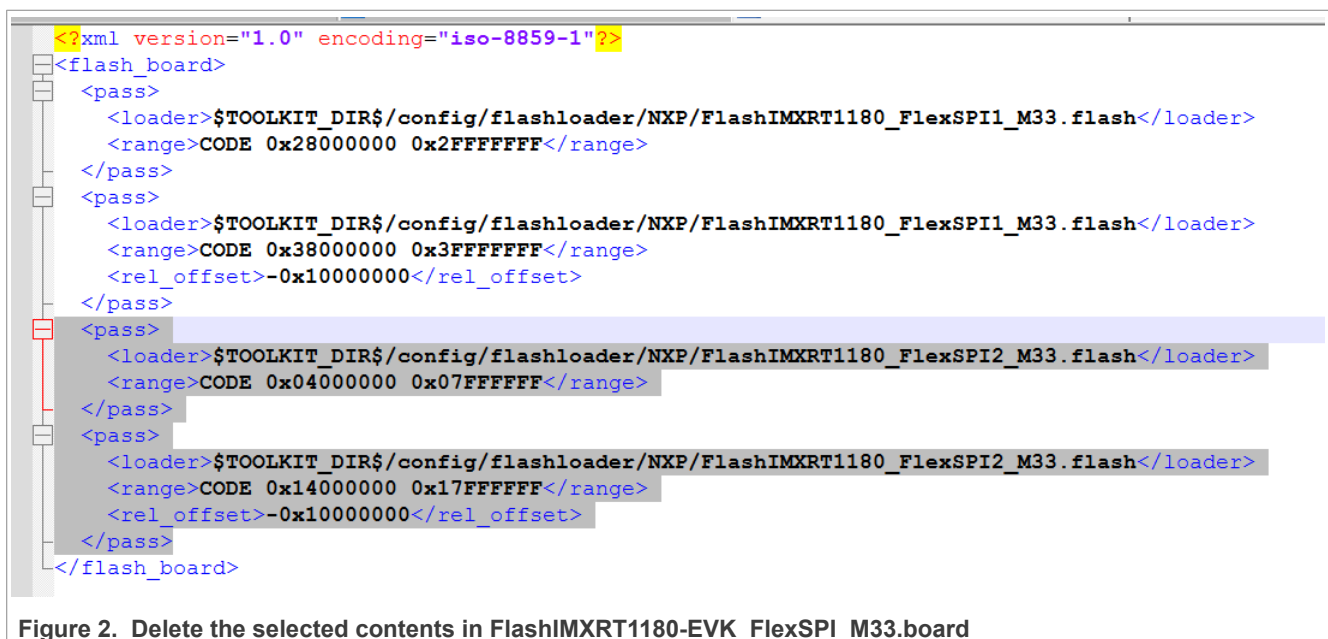


Figure 2. Delete the selected contents in FlashIMXRT1180-EVK_FlexSPI_M33.board

9.7 Other issues

The following are additional known issues in this release.

Table 6. Various other known issues

Ticket	Description	History
MCUX-66649	Build errors when create new project wizard with various component	2.15.000 RT1180

Table 6. Various other known issues...continued

Ticket	Description	History
MCUX-65840	Semihost terminal is not working well with JLink	2.15.000 RT1180
MCUX-66442	Edgefast a2dp_sink does not work properly on release target of MDK toolchain	2.15.000 RT1180
MCUX-65874	WIFI wifi_cli and wifi_wpa_supPLICANT will show no iperf summary in UDP server mode with both ipv4 and ipv6 in CM33 core	2.15.000 RT1180

9.8 Security ELE requires ping every 24 hours

The security ELE requires ping every 24 hours, which is mandatory.

Most of RT118x demos donot ping ELE every 24 hours, because those demos focus on the function demonstrate only. It is still MUST to ping ELE every 24 hours if demo run duration > 24 hours.

Check hello_world_demo_cm33 for example on how to ping ELE.

9.9 CM33 NPW project in MCUXpresso does not support POR run by default

When creating a new CM33 C/C++ project in MCUXpresso, the default is RAW image, which means it does not support POR run.

To make a default POR image, check the "**RAW/POR image switch**" section in Getting Started document.

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