

MCUXSDKMIMXRT106FRN

MCUXpresso SDK Release Notes for SLN-VIZNAS-IOT

Rev. 1.0.1 — 11/2020

1. Overview

The MCUXpresso Software Development Kit (SDK) is a collection of software enablement for microcontrollers that includes peripheral drivers, high-level stacks including FatFs, 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 more details about MCUXpresso SDK, see the MCUXpresso SDK homepage [MCUXpresso-SDK: Software Development Kit](#).

***The 1.0.1 launch of the VIZNAS SDK fixes an issue from the 1.0.0 launch in which the VIZNAS elock_oobe firmware did not have spectrum spreading enabled, which is required for the VIZNAS kit to maintain FCC compliance.*

2. MCUXpresso SDK

As part of the MCUXpresso software and tools, the MCUXpresso SDK is the evolution of the Kinetis SDK, including support for both LPC and i.MX System-on-Chips (SoC). The same drivers, APIs, and middleware are still available with support for Kinetis, LPC, 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.

NOTE

In order to maintain compatibility with legacy Freescale code, the filenames and the 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. It is suggested to keep the downloaded SDK archive in the root directory of your drive to avoid any unexpected build issues caused by deep path of files.

3. Development tools

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

- Makefiles support with GCC revision 9-2019-q4-major GCC9 from Arm Embedded
- MCUXpresso IDE v11.2.1

4. Supported development systems

This release supports boards and devices listed in [Table 1](#). The boards and devices in bold were tested in this release.

Table 1. Supported MCU devices and development boards

Development boards	MCU devices
SLN-VIZNAS-IOT	MIMXRT106FDVL6A

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5. Release contents

Table 2 provides an overview of the MCUXpresso SDK release package contents and locations.

Table 2. Release contents

Deliverable	Location
Boards	<install_dir>/boards
Boot Applications	<install_dir>/boards/<board_name>/sln_boot_apps
cJSON	<install_dir>/middleware/cjson
CMSIS Arm Cortex®-M header files, DSP library source	<install_dir>/CMSIS
CMSIS drivers	<install_dir>/devices/<device_name>/cmsis_drivers
Cypress BLE examples	<install_dir>/boards/<board_name>/ble_cypress_examples
Cypress Wiced SDK (WiFi, BLE)	<install_dir>/middleware/wiced
Cypress WiFi stack examples	<install_dir>/boards/<board_name>/wifi_cypress_examples
Documentation	<install_dir>/docs
Driver, SoC header files, extension header files and feature header files, utilities	<install_dir>/devices/<device_name>
E-Lock Application	<install_dir>/boards/<board_name>/sln_vision_apps/elock_oobe
FatFS stack	<install_dir>/middleware/fatfs
LittleFS	<install_dir>/middleware/littlefs
lwIP Documentation	<install_dir>/docs/lwip
lwIP stack	<install_dir>/middleware/lwip
mbed TLS	<install_dir>/middleware/mbedtls
Peripheral Drivers	<install_dir>/devices/<device_name>/drivers
RTOS Kernel Code	<install_dir>/rtos
Solutions IoT Common Platform	<install_dir>/middleware/sln_iot_common_platform
Tools	<install_dir>/tools
USB stack	<install_dir>/middleware/usb
Utilities such as debug console	<install_dir>/devices/<device_name>/utilities

6. MCUXpresso SDK release package

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

6.1 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, CMSIS derived device SVD, 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 is a CMSIS compliant startup code that efficiently transfers the code execution to the main() function.

6.1.1 Board support

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

6.1.2 Demo applications 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.

6.2 Middleware

6.2.1 USB stack

See the *MCUXpresso SDK USB Stack User's Guide* (document MCUXSDKUSBSUG) for more information.

6.2.2 TCP/IP stack

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.

6.2.3 Cypress Wiced SDK (WiFi, Bluetooth Low Energy)

The MCUXpresso SDK provides integration with Cypress Wiced SDK supporting the Murata Type 1DX and Azurewave AW-NM372SM modules based on the CYW4343W and CYW43438 processors.

6.2.4 File system

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.

6.2.5 RTOS

The MCUXpresso SDK is integrated with FreeRTOS OS.

6.2.6 CMSIS

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

6.2.7 Riverdi

The MCUXpresso SDK provides integration with the Riverdi RVT28UEFNWC10 display.

6.2.8 Oasis

The MCUXpresso SDK is shipped with the Oasis-Lite inference engine for secure face recognition.

7. MISRA compliance

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

Table 3. MISRA exceptions

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 8.13	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.

Exception rules	Description
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 goto 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

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:\nxp folder.

8.2 New Project Wizard compile failure

The following components request the user to manually select other components that they depend upon in order to compile. These components depend on several other components and the New Project Wizard (NPW) is not able to decide which one is needed by the user.

NOTE

xxx means core variants, such as, cm0plus, cm33, cm4, cm33_nodsp.

Also for low-level adapter components, currently the different types of the same adapter cannot be selected at the same time. For example, if there are two types of timer adapters, gpt_adapter and pit_adapter, only one can be selected as timer adapter in one project at a time. Duplicate implementation of the function results in an error.

8.3 RAM targets build issue in CMSIS bspack

Because CMSIS pack does not support different macro definitions for different targets, all RAM targets for projects inside CMSIS BSP PACKs for RT10XX boards will get the same macro definitions with Flash targets, resulting in build failure. To pass build for RAM targets, manually update the XIP_EXTERNAL_FLASH and XIP_BOOT_HEADER_ENABLE value to 0 in RTE_Components.h.

8.4 Known SDK issues

[Table 4](#) lists the known issues in v1.0.1 of SLN-VIZNAS-IOT SDK.

Table 4. Known SLN-VIZNAS-SDK issues

Issue #	Description	Impact	Workaround
RTFFI-403	User registered multiple times when wearing sunglasses	A single user can be registered multiple times	Register without sunglasses
RTFFI-495	Wi-Fi password cannot be 24 or more chars	Users cannot connect to Wi-Fi networks w/ passwords greater than 24 characters using the serial CLI interface	Use ViznCompanion APK on an Android tablet/smartphone
RTFFI-531	LPM Timeout too short for Wi-Fi Provisioning	Board may power down while Wi-Fi credentials are being typed via serial CLI command requiring the user to retype the credentials	Configure Wi-Fi settings with Low Power disabled
RTFFI-543	White LEDs don't start after reset	IR LEDs will be activated upon board reset rather than white LEDs because only one set of LEDs can be active at a time	None.
RTFFI-565	Single camera Emotion type not visible in recognition box when user name is too long	Users using UserID app type with emotion recognition enabled may have difficulty seeing the emotion recognized depending on the length of their name	None
RTFFI-570	Pop noise when playing registration-related messages	Boards with speakers attached will make pop noises when various messages are played	Create and use custom audio clips that do not generate the pop noise

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For sales office addresses, please send an email to: salesaddresses@nxp.com

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