MCUXSDKQN9090RN

MCUXpresso SDK Release Notes for QN9090

Rev. 10 — 11 February 2025 **Release notes**

Document information

Information	Content
Keywords	MCUXSDKQN9090RN, Release Notes, QN9090
Abstract	This document describes the MCUXpresso SDK release notes for QN9090.

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 for DSC further extends the SDK support to current 32-bit Digital Signal Controllers. 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, 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 was compiled and tested with these development tools:

- IAR Embedded Workbench for Arm version 9.60.2
- MCUXpresso IDE version 11.10.0
- Python 3 (Used by IAR and MCUXpresso IDE post build script, and the version should be newer than 3.2)
- GNU Tools for Arm Embedded Processors 8-2018-q4-major

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
QN9090 DK6 V3	QN9090

5 What is new

MCUXpresso SDK QN9090 2.6.16

This new release package for the QN9090 platform corresponds to the SDK 2.6.16 version of the program. Compared to previous SDK 2.6.15 release, this package provides several fixes and performance improvements, detailed as below.

Here are the changes since the SDK 2.6.15 release:

- **Framework**
  - Add API to handle DCDC output change based on the VBAT value for the high-power parts (041A/AM)
- **SDK**
  - Add new feature macro to distinguish whether the `GPADC_CTRL0_GPADC_TSAMP` control bit is on the device
  - Add new variable `extendSampleTimeNumber` to indicate the ADC extend sample time
  - Fix the bug that incorrectly sets the `PASS_ENABLE` bit based on the sample time setting
  - Fix DCDC 1v3 setting of Full Force Cycle bit
- **Bluetooth Controller**
  - No updates
- **Bluetooth Host**
  - No updates
- **Bluetooth LE Application examples improvements**
  - No updates

6 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`
CMSIS Arm Cortex®-M header files, DSP library source	`<install_dir>/CMSIS`
Demo applications	`<install_dir>/boards/<board_name>/demo_apps`
Documentation	`<install_dir>/docs`
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>`
Peripheral Drivers	`<install_dir>/devices/<device_name>/drivers`
RTOS examples	`<install_dir>/boards/<board_name>/rtos_examples`
RTOS Kernel Code	`<install_dir>/rtos`
Tools	`<install_dir>/tools`
Utilities such as debug console	`<install_dir>/devices/<device_name>/utilities`

7 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.

7.1 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.

7.1.1 Board support

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

7.1.2 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.

7.2 Wireless

The following connectivity-supporting documentation is included in the documentation package:

- *Bluetooth Low Energy Host Stack API Reference Manual*
- *Bluetooth Low Energy Application Developer's Guide*
- *Bluetooth Low Energy Demo Applications User's Guide*
- *Bluetooth Low Energy Host Stack FSCI Reference Manual*
- *Connectivity Framework Reference Manual*

7.2.1 Bluetooth LE software

This version corresponds to the QPATCH1 build of the QN9090 Bluetooth LE Software. The Bluetooth LE v5.0 features in this release have undergone a Bluetooth SIG qualification listing process, as follows:

- Launch Studio Host
- Launch Studio Controller

7.3 Middleware

7.3.1 RTOS

The MCUXpresso SDK is integrated with FreeRTOS OS.

7.3.2 Other middleware

Optional middleware packages can be included in the release based on the user selection. See *<install_dir>/SW-Content-Register.txt* for a list of components and associated licenses.

8 Known issues

The following are the known issues, limitations,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:\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 CMSIS PACK new project compile failure

The generated configuration cannot be applied globally. The components, `serial_manager_usb_cdc_virtual` and `serial_manager_usb_cdc_virtual_xxx` (`xxx` means core variants like `cm0plus`, `cm33`, `cm4`, and `cm33_nodsp`) are unsupported for new project wizard of CMSIS pack and will lead to compile failure if selected while creating new project(s).

8.4 Other limitations

- FreeRTOS tickless mode configuration may exhibit stability issues. An update will be available in an upcoming maintenance release.
- There's a compiling issue while creating the project in MCUXpresso without selecting the board. To fix this issue, add *board_utility.h* to the project manually.
- Using `malloc` from *libc* (and related functions) is not supported. This action collides with the allocator based on the `pvHeap` functions (they use the same memory area). None of the standard SDK apps uses `malloc`. If the need arises to use `malloc` in a customer application, use a mechanism similar to the wrapping described at linux.org/docs/man1/ld.html.

9 About the ROM patch

The current release of the ROM patch is version 5. Devices may be released from stock with an older version of the ROM patch. When using the DK6 CLI Flash Programmer, this will be indicated by the message **WARNING: Bootloader in device is out of date. See application note JN-AN-1263 or contact support for update information**. To install the current release of the ROM patch, download the *JN5189/QN9090/K32W061 ROM Patch* (document JN-AN-1263) and follow the instructions there.

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10 Revision history

Table 3 summarizes the revisions to this document.

Table 3. Revision history

Document ID	Release date	Description
MCUXSDKQN9090RN v.10	11 February 2025	Updated for MCUXpresso SDK 2.6.16 release • Updated Section 3 "Development tools" • Updated Section 5 "What is new"
MCUXSDKQN9090RN v.9	22 July 2024	Updated for MCUXpresso SDK 2.6.15 release • Updated Section 5 "What is new"
MCUXSDKQN9090RN v.8	23 April 2024	Updated for MCUXpresso SDK 2.6.14 release • Updated Section 3 "Development tools" • Updated Section 5 "What is new"
MCUXSDKQN9090RN v.7	01 November 2023	Updated for MCUXpresso SDK 2.6.13 release • Updated Section 5 "What is new"
MCUXSDKQN9090RN v.6	07 July 2023	Updated for MCUXpresso SDK 2.6.12 release • Updated Section 3 "Development tools" • Updated Section 5 "What is new"
MCUXSDKQN9090RN v.5	21 April 2023	Updated for MCUXpresso SDK 2.6.11 release • Updated Section 3 "Development tools" • Updated Section 5 "What is new"
MCUXSDKQN9090RN v.4	06 February 2023	Updated for MCUXpresso SDK 2.6.10 release • Updated Section 3 "Development tools" • Updated Section 5 "What is new"
MCUXSDKQN9090RN v.3	16 December 2022	Updated for MCUXpresso SDK 2.6.9 release • Updated Section 3 "Development tools" • Updated Section 5 "What is new"
MCUXSDKQN9090RN v.2	09 November 2022	Updated for MCUXpresso SDK 2.6.8 release • Updated Section 3 "Development tools" • Updated Section 5 "What is new"
MCUXSDKQN9090RN v.1	4 March 2022	Updated for MCUXpresso SDK 2.6.5 release • Updated Section 3 "Development tools" • Updated Section 5 "What is new"
MCUXSDKQN9090RN v.0	6 August 2021	Initial release for MCUXpresso SDK 2.6.4 release

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