

Freescale MQX™ RTOS 4.1.0 i.MX 6SoloX Release Notes

1 Introduction

These are the Release Notes for the i.MX 6SoloX standalone package for Freescale MQX™ RTOS 4.1.0. Freescale i.MX 6SoloX belongs to the i.MX 6 series processor family of 32-bit application processors, and provides one ARM® Cortex®-A9 processor and one ARM Cortex®-M4 processor. The software is built based on the Freescale MQX RTOS version 4.1.0 and runs on the i.MX 6SoloX Cortex-M4 processor. It includes the full set of RTOS services and a standard set of peripheral drivers. Prior installation of Freescale MQX RTOS 4.1.0 is not required to install this package.

For more information, see the *Freescale MQX™ RTOS 4.1.0 Release Notes* (document MQXRN) and *Getting Started with Freescale MQX™ RTOS 4.1.0 on i.MX 6SoloX* (document MQX410IMX6SXGS).

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1.1 Development tools

The i.MX 6SoloX release was tested with the following development tools:

- IAR Embedded Workbench® for ARM® Version 7.10.3 (Windows® OS only)
- ARM-GCC V4.8 2014_Q1
- ARM Development Studio 5 (DS-5™) version 5.18.0
- Lauterbach TRACE32 PowerView for ARM version S.2012.04.000036477 (Windows OS only)

1.2 System requirements

The system requirements are defined by the development tool requirements. There are no special host system requirements for the Freescale MQX RTOS distribution.

- Minimum PC configuration:
 - As required by Development and Build Tools
- Recommended PC configuration:
 - 2GHz processor – 2 GB RAM – 2 GB free disk space
- Software requirements:
 - OS: Windows® 7 or later, or Ubuntu 12.04 or later

1.3 Target requirements

The i.MX 6SoloX package was tested with the following hardware configuration:

- i.MX 6SoloX SABRE-SDB Rev. B with a PCIMX6X4EVM10AB processor
- i.MX 6SoloX SABRE-AI MCIMX6SXAICPU2 Rev. A with a PCIMX6X4AVM08AB processor
 - Extension board MCIMXABASEV1 Rev. E for peripherals.

2 Features

2.1 Key features

This package provides initial support for the i.MX 6SoloX System module and a standard set of features and example applications.

This section describes the major changes and new features implemented in this release.

- Cortex-M4 processor clock: 227 MHz (default)
- AHB bus clock: 132 MHz (default)
- BSP Timer: SysTick
- Default console: ittyb

The package supports these features:

- PSP support for the i.MX 6SoloX System module
- BSP for the i.MX 6SoloX SABRE-SDB board and i.MX 6SoloX SABRE-AI board
- MCC for the communication between the i.MX 6SoloX Cortex-A9 processor and Cortex-M4 processor
- Standard set of I/O drivers supporting the i.MX 6SoloX peripherals, including:
 - ADC driver
 - FlexCAN driver
 - I2C interrupt and polled master/slave driver
 - GPIO driver
 - HWTIMER driver with EPIT
 - UART driver
 - SPI master/slave driver
 - Sensor drivers
 - MAG3110 Magnetometer
 - MMA8451Q Accelerometer
- Example applications demonstrating MQX RTOS, MCC usage and low power functions.
- eCompass example demonstrating the sensor's capabilities.
- RDC settings
 - MQX RTOS on ARM Cortex-M4 runs in RDC domain 1

- Peripherals reserved for RDC domain 1 access only
 - ADC1
 - ADC2
 - UART2
 - I2C3
 - ECSPI4
 - ECSPI5
 - CAN1
 - CAN2
 - EPIT1
 - EPIT2
 - WDOG3
- MQX RTOS code region is reserved for RDC domain 1 access only
 - Flash target
 - SDB: [0x78000000, 0x78040000)
 - AI: [0x68000000, 0x68040000)
 - RAM target: [0x00900000, 0x00920000)
- Peripheral driver that supports RDC SEMA42 shared access
 - GPIO driver

2.2 Limitations


2.2.1 Boot loader

On the i.MX 6SoloX chip, ARM Cortex M4 is an auxiliary core and cannot boot by itself, so the MQX RTOS must be loaded and booted by a loader executing on the main core or through a debugger script.

In this release, we provide two kinds of loaders:

- U-Boot for the board
- TRACE32 script (debugger, on Windows OS only)

In our examples, the target image is running out of the QSPI flash, and U-Boot can be used to kick off MQX RTOS.



To enable the TRACE32 debugger loader, the first step is to rebuild the example with the RAM target link file, and then follow the instructions in “Running with TRACE32 debugger” in *Getting Started with Freescale MQX™ RTOS 4.1.0 on i.MX 6SoloX* (MQX410IMX6SXGS) to load the program.

2.2.2 Debugger

Although IAR and DS5 are supported to build the MQX RTOS and examples, the debugger part of these IDE tools are not enabled.

Only TRACE32 is able to debug the programs built from ARM-GCC, IAR and DS5.

2.2.3 Flash downloader

i.MX 6SoloX flash downloader is not supported in the TRACE32 debugger, and only the RAM target program can be debugged at present.

2.3 Example applications

This package contains applications demonstrating the kernel and peripherals on the i.MX 6SoloX System. The applications can be found at the following locations:

- `<install_dir>/mqx/examples`: standard set of examples for kernel features and basic peripheral drivers
- `<install_dir>/mcc/examples`: standard set of examples for MCC features

2.4 Release contents

This section provides an overview of the release content.

Deliverable	Location
MQX PSP Source Code and Examples	<install_dir>/mqx/...
MQX PSP source code for i.MX 6SoloX Cortex-M4	.../mqx/source/psp/cortex_m
MQX PSP build projects	.../mqx/build/<tool>/psp_imx6sx_<board>_m4/...
MQX example applications	.../mqx/examples/...
MQX BSP Source Code	<install_dir>/mqx/...
MQX BSP source code	.../mqx/source/bsp/imx6sx_<board>_m4
MQX BSP build projects	.../mqx/build/<tool>/bsp_imx6sx_<board>_m4/...
MQX MCC Source Code and Examples	<install_dir>/mcc/...
MCC source code	.../mcc/source
MCC build projects	.../mcc/build/<tool>/mcc_imx6sx_<board>_m4/...
MCC examples applications	.../mcc/examples/...
PC Host Tools and U-Boot	<install_dir>/tools
Toolchain Plug-ins	<install_dir>/tools/ds5
U-Boot for SDB board	<install_dir>/tools/u-boot-sdb.imx
U-Boot for SABRE-AI board	<install_dir>/tools/u-boot-ai.imx
Documentation	<install_dir>/doc
User Guides and Reference Manuals for MQX RTOS, IO Drivers, MCC, etc.	.../doc

3 Installation Instructions

3.1 Installation guide

For Windows OS: Run the i.MX 6SoloX MQX RTOS package installer and proceed according to instructions. This package does not require prior installation of Freescale MQX RTOS 4.1.0.

For Ubuntu: Unpack the i.MX 6SoloX MQX RTOS compressed package. This package does not require prior installation of Freescale MQX RTOS 4.1.0.

3.1.1 Build procedure

For build procedures, see *Getting Started with Freescale MQX™ RTOS 4.1.0 on i.MX 6SoloX* (document MQX410IMX6SXGS).

3.1.2 Default jumper settings

For board information, see *Getting Started with Freescale MQX™ RTOS 4.1.0 on i.MX 6SoloX* (document MQX410IMX6SXGS).

3.2 Running the examples

For instructions on running the examples, see *Getting Started with Freescale MQX™ RTOS 4.1.0 on i.MX 6SoloX* (document MQX410IMX6SXGS).

4 Known Issues

- To get TCM fully used, `_mem_extend()` is called in BSP with MQX MEM allocator (highly recommended). Because LWMEM cannot support the extending function, it can only manage half of the TCM as data area. This might cause the out-of-memory error (at linkage or runtime) with the LWMEM configuration.
- In SPI master and slave example, it reuses the SD2 (WIFI) socket pins for connection, and this conflicts with the Linux[®] OS. Make sure to only run the SPI master/slave example without the Linux OS.

5 Revision History

Table 1 Revision history

Revision number	Date	Substantive changes
0	01/2015	Initial release.
1	05/2015	Changed Section 3 Installation Instructions .

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Document Number: MQX410IMX6SXRN
Rev. 1
05/2015

