

MQX™ RTOS Release Notes for Kinetis SDK 1.1.0 MK21DA5 and MKW24D5 Freescale Platforms

Contents

1 Overview

These are the Release Notes for the Freescale MQX™ RTOS for Kinetis SDK 1.1.0 TWR-K21D50M, TWR-KW24D512 and USB-KW24D512 Freescale Platforms using the MK21DN512AVMC5 and MKW24D512VHA5 microcontrollers. Freescale CPU_MK21DN512AVMC5 and CPU_MKW24D512VHA5 belong to the Kinetis K and W series processor family of the 32-bit microcontrollers. The software is based on Freescale Kinetis SDK (KSDK) version 1.1.0. It includes the full set of RTOS services and a standard set of peripheral drivers.

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1.1 Development tools

The TWR-K21D50M, TWR-KW24D512 and USB-KW24D512 Freescale platform release was tested with these development tools:

- IAR Embedded Workbench for ARM[®] version 7.20.2
 - Support available for Kinetis ARM Cortex[®]-M4 devices
 - See build projects in the iar subdirectories
- ARM[®] Keil[®] development tool v5.11
 - Support available for Kinetis ARM Cortex-M4 devices
 - See build projects in mdk subdirectories
- Kinetis Design Studio IDE v2.0
 - Support available for Kinetis ARM Cortex CPUs
 - See build projects in kds subdirectories
- Atollic[®] TrueSTUDIO[®] for ARM v5.2.0
 - Support available for Kinetis ARM Cortex CPUs
 - See build projects in atl subdirectories
- ARM GCC 4.8.3 (GCC ARM Embedded 4.8-2014-q1-update)
 - Support available for Kinetis ARM Cortex CPUs
 - See build projects in ARM gcc subdirectories

1.2 System requirements

The system requirements are defined by the development tool requirements. There are no special host system requirements for the Freescale Kinetis SDK distribution itself.

The minimum PC configuration is determined by the development tools.

The recommended PC configuration is 2 GHz processor, 2 GB RAM, and 2 GB free disk space.

1.3 Target requirements

The Freescale MQX RTOS package for Kinetis SDK 1.1.0 was tested with this hardware configuration:

- TWR-K21D50M Rev. B Tower System module with a MK21DN512AVMC5 processor
- TWR-KW24D512 Rev. C Tower System module with a MKW24D512VHA5 processor

- USB-KW24D512 with a MKW24D512VHA5 processor

2 Features

2.1 Key features

This package provides support for the TWR-K21D50M, TWR-KW24D512 and USB-KW24D512 Freescale platform with MK21DN512AVMC5 and MKW24D512VHA5 processors. Moreover, the package has a standard set of features and example applications.

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

- MQX RTOS Timer: SysTick
- Default console: UART1 (CDC virtual COM) for Freescale Tower TWR-KW24D512 platform
- Default console: UART2 (CDC virtual COM) for Freescale Tower TWR-K21DN50M platform
- USB-KW24D512 does not support the CDC virtual COM and does not support UART port because of the hardware limitation

The package supports these features:

- MQX RTOS support for the TWR-K21D50M, TWR-KW24D512 and USB-KW24D512 Freescale platform with MK21DN512AVMC5 and MKW24D512VHA5 microcontrollers
- MQX RTOS STDLIB
- nShell
- MFS file system
- KSDK support for the MK21DN512AVMC5 and MKW24D512VHA5 microcontroller

2.2 Limitations

This release does not support these features:

- UART console serial output for USB-KW24D512

2.3 Example applications

This package contains applications demonstrating the MQX RTOS kernel and peripherals on the TWR-K21D50M, TWR-KW24D512 and USB-KW24D512 Freescale platform. The applications can be found in these locations:

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

2.4 Release contents

This section provides an overview of the release content.

| Deliverable | Location |
|--|--|
| Specific content for the evaluation boards | <install_dir>/rtos/mqx/... |
| MQX source code for Kinetis | .../mqx/source/ |
| MQX build projects | .../mqx/build/<compiler>/mqx_twrk21d50m /... .../mqx/build/<compiler>/mqx_twrkw24d512 /... .../mqx/build/<compiler>/mqx_usbkw24d512/... |
| MQX example applications | .../mqx/examples/... |
| MQX RTOS STDLIB Source Code | <install_dir>/rtos/mqx_stdlib/... |
| MQX RTOS STDLIB build projects | ../ mqx_stdlib /build/<compiler>/ mqx_stdlib _twrk21d50m ../ mqx_stdlib /build/<compiler>/ mqx_stdlib _twrkw24d512 ../ mqx_stdlib /build/<compiler>/ mqx_stdlib _usbkw24d512 |
| MQX RTOS STDLIB Source Code | ../ mqx_stdlib /source |
| KSDK MQX Source Code | <install_dir>/lib/ ksdk_mqx_lib |
| KSDK build projects | ../ ksdk_mqx_lib /build/<compiler>/ ksdk_mqx_lib _twrk21d50m ../ ksdk_mqx_lib /build/<compiler>/ ksdk_mqx_lib _ twrkw24d512 ../ ksdk_mqx_lib /build/<compiler>/ ksdk_mqx_lib _ usbkw24d512 |
| KSDK source | <install_dir>/platform |
| Shell Library Source Code | <install_dir>/rtos/nshell/... |
| Shell source code | .../nshell/source |
| Shell build projects | .../nshell/build/<compiler>/shell_ twrk21d50m .../nshell/build/<compiler>/shell_ twrkw24d512 .../nshell/build/<compiler>/shell_ usbkw24d512 |
| MFS Library Source Code | <install_dir>/filesystem/mfs/... |
| MFS source code | .../mfs/source |
| MFS build projects | .../mfs/build/<compiler>/mfs_ twrk21d50m .../mfs/build/<compiler>/mfs_ twrkw24d512 .../mfs/build/<compiler>/mfs_ usbkw24d512 |
| PC Host Tools | <install_dir>/tools |
| Documentation | <install_dir>/rtos |

3 Installation Instructions

3.1 Installation guide

Run the installer for the Freescale MQX RTOS package for the Kinetis SDK 1.1.0 TWR-K21D50M, TWR-KW24D512 and USB-KW24D512 Freescale platforms and install it in the folder

<SDK_install_dir>/rtos/mqx/.

3.1.1 Build procedure

For build procedures, see the *Getting Started with Freescale MQX™ RTOS for Kinetis SDK (KSDK) (MQXKSDKGSUG)*.

3.1.2 Jumper settings

These are the jumper settings for TWR-K21D50M standalone operation:

- J17 at position 3-5 , J24 at position 1-2
- J6 default OFF, J7 at position 1-2, J8 at position 1-2
- J12 default on to enable Potentiometer
- J15 default on all to enable LEDs

These are the jumper settings for TWR-KW24D512 standalone operation:

- J8 , J2 OFF are jumper default settings
- J18 jumper to select UART debug console
 - J18 at position 1-2 ,4-5, 7-8, 10-11 for UART onboard
 - J18 at position 2-3, 5-6, 8-9, 11-12 for UART on TWR-ELEVATOR

3.1.3 Board-specific build targets

- Internal Flash (Debug and Release): These targets enable building applications suitable for booting the system from the internal Flash memory. After reset, the code is executed from the internal Flash.

4 Patch Description

| Patch Name | Description |
|----------------------------------|---|
| Keil.Kinetis_K20_DFP.1.1.0.pack | Patch K21DA5 for Keil μ Vision 5.11 |
| Keil.Kinetis_KWxx_DFP.1.0.0.pack | Patch KW24D5 for Keil μ Vision 5.11 |

5 Applying Patches

Install the MK21DN512xxx5 and MKW24DN512xxx5 to apply a patch for Keil μ Vision 5.11. These patches can be obtained from <http://www.keil.com/dd2/pack/>.

6 Revision history

This table summarizes revisions to this document.

| Revision History | | |
|------------------|---------|---------------------|
| Revision number | Date | Substantive changes |
| 0 | 02/2015 | Initial release |

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