Freescale MQX™ RTOS 3.8.0 TWR-K60D100M Standalone Package

Release Notes

PRODUCT:	K60D100M Standalone Package for Freescale MQX™ RTOS 3.8.0
PRODUCT VERSION:	1.0
DESCRIPTION:	Adding support for K60D100M to Freescale MQX™ RTOS 3.8.0
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1 Introduction

This release note documents the K60D100M standalone package for Freescale MQX™ RTOS 3.8.0. Freescale K60D100M is a member of the Kinetis Arm Cortex processor family. The software is built base on MQX version 3.8.0. It includes RTOS basic and standard set of peripheral drivers.

For more detailed information about MQX please see Freescale MQX™ 3.8.0 Release notes and Getting started documents.

2 Requirements

This package can be installed and used standalone.

2.1 Development tools

The TWR- K60D100M Package for Freescale MQX 3.8.0 was tested with the following development tools:

- CodeWarrior Development Studio for Microcontrollers Version 10.2 with ARM compiler Service Pack installed (MCU update Version MCU10_2SP for K60 P2).
  - Support available for Kinetis and ColdFire devices
  - See build projects in `cw10` subdirectories

- IAR Embedded Workbench for ARM Version 6.30 or higher
  - Support available for Kinetis ARM®CortexM4 devices
  - See build projects in `iar` subdirectories
- KEIL ARM 4.23 or higher
  - Support available for Kinetis ARM®CortexM4 devices
  - See build projects in `uv4` subdirectories

2.2 System Requirements

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

2.3 Target Requirements

The TWRK60D100M Freescale MQX 3.8 was tested with the following hardware configuration:

- TWR- K60D100M Rev. A processor board
- TWR-SER Rev. C serial board
- TWR-ELEV Primary and Secondary - four-storey elevator boards
- TWR-MEM Rev. B memory extension board

3. Features

3.1 Key Features

This package brings initial support of TWR- K60D100M platform. Standard set of features and example application is provided.
This section describes the major changes and new features implemented in this release.

Core clock: 96MHz
Bus clock : 48MHz
Default console: ttyf
BSP timer: system tick

New MK60D100M support files :

- PSP support for K60D100M platform
- BSP for TWR- K60D100M evaluation kit
- Standard set of I/O drivers supporting the K60D100M peripherals including:
  - ADC driver
  - CAN driver
  - GPIO driver.
  - LWGPIO driver
  - Serial interrupt and polled driver
  - SPI interrupt and polled driver.
  - I2C interrupt and polled driver.
  - Flash Driver
  - RTC Driver.
  - Timer
  - CRC driver
  - SD card driver
  - Compact Flash Card Driver
  - Ethernet Driver
  - USB Driver
- USB Host and Device drivers and stacks.
- Example and demo applications demonstration MQX, USB and MFS usage

3.2 Example Applications

MQX 3.8.0 K60D100M standalone package release contains applications demonstrating kernel, peripheral, USB functionality on TWR-K60D100M tower kit. The applications can be found on following location:

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

- `<install_dir>/mfs/examples` - example applications demonstrating the MFS file system features

- `<install_dir>/usb/host/examples` - examples demonstrating USB Host stack features and class drivers

- `<install_dir>/usb/device/examples` - examples demonstrating USB Device class implementations

- `<install_dir>/demo/` - various demo application showing more complex examples

3.3 Unsupported features :

- These modules which are not supported in the current standalone package are listed as below:
    - *SAI driver*

3.4 Release contents :

This section gives an overview about the release content.

Deliverable	Location
Pre-compiled MQX Libraries	<install_dir>/lib/...
MQX PSP Library	.../lib/twrk60d100m.cw10/psp
MQX BSP Library	.../lib/twrk60d100m.cw10/bsp
MQX MFS (File System)	.../lib/twrk60d100m.cw10/mfs
MQX USB Libraries	.../lib/twrk60d100m.cw10/usb
MQX RTCS TCP/IP stack libraries	.../lib/twrk60d100m.cw10/rtcs
MQX Shell Library	.../lib/twrk60d100m.cw10/shell
MQX PSP Source Code and Examples	<install_dir>/mqx/...
MQX PSP source code for Cortex	.../mqx/source/psp/cortex
MQX PSP build projects	.../mqx/build/cw10/psp_twrk60d100m /…
MQX example applications	.../mqx/examples/...
MQX BSP Source Code	<install_dir>/mqx/...
MQX BSP source code for TWRK60D100M board	.../mqx/source/bsp/twrk60d100m
MQX BSP build projects	../mqx/build/cw10/bsp_twrk60d100m /…
RTCS Source Code and Examples	<install_dir>/rtcs/...
RTCS source code	.../rtcs/source
RTCS build projects	.../rtcs/build/cw10/rtcs_twrk60d100m
RTCS example applications	.../rtcs/examples
USB Host Drivers Source Code and Examples	<install_dir>/usb/host/...
USB Host source code and class drivers	.../usb/host/source
HUB Class Driver	.../usb/host/source/classes/hub
Human Interface Device (HID) Class Driver	.../usb/host/source/classes/hid
Mass Storage (MSD) Class Driver	.../usb/host/source/classes/msd
Printer Class Driver	.../usb/host/source/classes/printer
CDC Class Driver	.../usb/host/source/classes/cdc
USB Host build projects	.../usb/host/build/cw10/usb_hdk_twrk60d100m
USB Host example applications	.../usb/host/examples
USB Device Drivers Source Code and Examples	<install_dir>/usb/device/...
USB Device source code	.../usb/device/source
USB Device build projects	.../usb/device/build/cw10/usb_ddk_twrk60d100m
USB Device example applications	.../usb/device/examples
Shell Library Source Code	<install_dir>/shell/...
Shell source code	.../shell/source
Shell build projects	.../shell/build/cw10/shell_twrk60d100m
CodeWarrior Support	<CodeWarrior_dir>/...
MQX Task-aware Debugger plug-in for CW10	<cw10_dir>/MCU/bin/plugins/debugger/rtos
PC Host Tools	<install_dir>/tools
TFS Make Utility	…/tools/mktfs.exe
Check for Latest Version tool	…/tools/webchk.exe
Documentation	<install_dir>/doc
User Guides and Reference Manuals for MQX RTOS, RTCS, MFS, IO Drivers, USB etc. RTOS, IO Drivers, etc.	…/doc

4 Installation Instructions

4.1 Installation Guide

Run the K60D100M Package installer and proceed according to instructions. This package can be used independently of the current MQX 3.8.0 folder.

4.2 Board-specific information related to TWR-K60D100M

All jumper and other hardware switches not specifically described below are expected in factory default positions. Please refer to the board User's Guide for the default settings.

4.2.1 TWR-K60D100M-KIT

The K60D100M Package supports the following hardware configuration:

- TWR- K60D100M Rev. A processor board
- TWR-SER Rev. C serial board
- TWR-ELEV Primary and Secondary - four-storey elevator boardss
- TWR-MEM Rev. B memory extension board.

4.2.2 Important jumper settings

For basic operations, make sure following jumper settings are applied :

- For using USB Host mode, jumpers on position
  - TWR-SER board, J16 on position 1-2(VB_HOST)
  - TWR-SER board, J10 on default position 1-2(USB host)

- For using USB Device mode, jumpers on position
  - TWR-SER board, J16 on position 3-4(VB_DEV)
  - TWR-SER board, J10 on position 2-3(USB device)

- For using Ethernet device, jumpers on position
  - TWR-K60D100M - Jumper J10 on position 2-3 - processor clock taken from the TWR-SER board
  - TWR-SER - CLK_SEL 3-4
  - TWR-SER - CLKIN-SEL 2-3 (processor clock is taken from PHY)
  - TWR-SER - ETH-CONFIG J12 9-10 to select RMII communication mode
  - Important: Both processor and serial board (TWR-SER) has to be plugged in the Tower. Processor is using external clock from Ethernet PHY on the serial card.

4.2.3 Building procedure

Run the self-extracting K60D100M package installer and proceed according to instructions. The files are installed directly into the specified folder.
PSP and BSP libraries must to be built before using any application or have any change kernel or I/O drivers.

The PSP Platform-specific code from `/mqx/source/psp/cortex` is built together with generic MQX core files. The BSP Board-specific code from `/mqx/source/bsp/twrk60d100m` is built with I/O driver files from `/mqx/source/bsp/io`.

Step1 – Build PSP library

Build project at location: `<install_dir>/mqx/build/cw10/psp_ twrk60d100m`

Step2 – Build BSP library

Build project at location: `<install_dir>/mqx/build/cw10/bsp_ twrk60d100m`

Step3 – Build applications

MQX 3.8 K60D100M package release contains applications demonstrating kernel, peripherals, TWR- K60D100M tower kit. Refer section 3.2 for applications location.

4.2.4 Board-specific build targets:

Internal Flash (Debug and Release) - these targets enable to build applications suitable for booting the system up from Internal Flash memory. After the reset the code will be executed from Internal Flash

5 Known issues

5.1 Compact Flash card Driver

- Some Compact Flash cards does not work correctly with TWR-MEM and MQX CF Card driver. An issue in the TWR-MEM CPLD code REV A causes incorrect communication with some types of cards (e.g. Kingston). A fixed CPLD firmware is available in `<install_dir>/mqx/source/io/pccard/twr_mem_pccard_cpld/` folder. The firmware can be loaded to the TWR-MEM CPLD using Altera Quartus II design tool and BLASTER connection cable.

5.2 Ram target

- Example projects contain different build configurations for code execution from Flash or RAM memory. The RAM-based execution may be faster to debug but not all examples fit into RAM and may fail to link.

5.3 Flashing issues in CW 10.2

- K60 P2 has issues flashing by J-Link in CW 10.2

6 Other notes

- For KEIL ARM Compiler, the libraries are pre-compiled for “Release” target only, “Debug” target need to be compiled before first use.