Simple Media Access Controller (SMAC) Software for the Kinetis MKW41Z Dual Mode Wireless Microcontroller, Version 3.3.5

Release Notes

1 Overview

These release notes pertain to the software that was developed for the Kinetis MKW41Z dual mode wireless microcontroller. This document is for internal development and testing teams reference only. These notes pertain to the MKW41Z SMAC Software version 3.3.5.

Contents

2   Release Contents

The Freescale KW41Z SMAC software version 3.3.5 release main wireless connectivity components are listed in the table below.

Table 1. Release Contents

(File | Folder) Name	Description
boards/[*board*]/wireless_examples/smac/connectivity_test	SMAC Wireless UART example application
boards/[*board*]/wireless_examples/smac/wireless_uart	SMAC Connectivity Test example application
boards/[*board*]/wireless_examples/smac/wireless_messenger	SMAC Wireless Messenger example application
boards/[*board*]/wireless_examples/smac/low_power_node	SMAC low power node example application
middleware/wireless/smac_3.3.5	KW41Z SMAC
middleware/wireless/ieee_802_15_4_5.3.5/phy	KW41Z IEEE 802.15.4 2.4 GHz OQPSK PHY
doc/wireless	Wireless connectivity documentation
middleware/wireless/framework_5.3.5/Common	Connectivity Framework common files
middleware/wireless/framework_5.3.5/LowPower	Low Power Module
middleware/wireless/framework_5.3.5/MemManager	Memory Manager
middleware/wireless/framework_5.3.5/Messaging	Messaging API
middleware/wireless/framework_5.3.5/Panic	Panic module
middleware/wireless/framework_5.3.5/RNG	Random Number Generator wrapper
middleware/wireless/framework_5.3.5/SerialManager	Serial Manager for various interface
middleware/wireless/framework_5.3.5/TimersManager	Timers Manager module
middleware/wireless/framework_5.3.5/SecLib	Security Library
tools/wireless/binaries	Example applications pre-compiled binaries

Please refer to http://www.nxp.com/connectivity for more information on NXP wireless connectivity platforms

3   What's New and Change Log

This section describes the major changes and new features implemented in the MKW41Z SMAC software releases:

3.1 MKW41Z SMAC Software v3.3.5

- This version corresponds to a maintenance release of build of the MKW41Z SMAC Software. Some of its major new features, compared to the previous SMAC release on Kinetis MKW41Z wireless microcontrollers, include:
    - o Added new functionalities in the Wireless Framework modules
    - o Added new functionalities in the Connectivity PHY module

3.2 MKW41Z SMAC Software v3.3.4

- This version corresponds to a maintenance release of build of the MKW41Z SMAC Software. Some of its major new features, compared to the previous SMAC release on Kinetis MKW41Z wireless microcontrollers, include:
    - o Updated transceiver driver for better RF performance
    - o General bug fixing

3.3 MKW41Z SMAC Software v3.3.3

- This version corresponds to a maintenance release of build of the MKW41Z SMAC Software. Some of its major new features, compared to the previous SMAC release on Kinetis MKW41Z wireless microcontrollers, include:
    - o MCUXpresso IDE support
    - o FreeRTOS v9.0.0 support
    - o Updated transceiver driver for better RF performance
    - o Updated DCDC converter driver with new voltage ranges
    - o General bug fixing
    - o Discontinued uC/OS-II RTOS support
    - o Discontinued Kinetis Design Studio support

3.4 MKW41Z SMAC Software v3.3.2

- This version is the general availability (GA) build of the MKW41Z SMAC. Some of the new features compared to the Beta build include:
    - o Crystal trim feature in Connectivity Test application
    - o Better alignment of connectivity folder structure with the Kinetis SDK.
    - o Optional packaging in .tar.gz format for Linux host machines
    - o uC/OS-II support

3.5 MKW41Z SMAC Software v3.3.1

- This version is the Beta build of the MKW41Z SMAC. Some of the new features compared to the Alpha build include:
  - o Wireless Messenger and Low Power Demo applications
  - o Support for the Kinetis Design Studio IDE and the GNU Toolchain

3.6 MKW41Z SMAC Software v3.3.0

- This version is the Alpha build of the MKW41Z SMAC. Some of the notable features include:
  - o KSDK 2.0 integration of the SMAC and Connectivity Framework software
  - o Enablement for the FRDM-KW41Z and USB-KW41Z evaluation boards

4 Software Deployment Considerations

- The SMAC applications in this package have been built in a Kinetis SDK version 2 environment, making use of the FreeRTOS kernel and microcontroller peripheral drivers included in this SDK. This package includes a full build of the Kinetis SDK v2 for Kinetis MKW41Z/31Z/21Z.

- IAR Embedded Workbench for ARM® **v7.80.4** was used to build and test the SMAC example IDE projects included in this release.

- MCUXpresso IDE **v10.1.1** was used to build the Bluetooth low energy associated example applications IDE projects.

5 Embedded System Considerations

- This package supports the following board setups: FRDM-KW41Z and USB-KW41Z
- The FRDM-KW41Z and USB-KW41Z boards feature a composite USB device called OpenSDA which serves as debugger interface and as USB to serial converter via a virtual COM port application. Several firmware images can be programmed on the FRDM-KW41Z OpenSDA device, among which:

    http://developer.mbed.org/handbook/CMSIS-DAP

    https://www.segger.com/opensda.html

    http://www.pemicro.com/opensda/

- If your FRDM-KW41Z board is configured for the buck or boost modes of the DCDC converter inside the KW41Z microcontroller, the firmware too needs to be configured for these modes of the DCDC, by setting the following defines: *gDCDC_Enabled_d* to 1 and *APP_DCDC_MODE* to *gDCDC_Mode_Buck_c* or *gDCDC_Mode_Boost_c* respectively, in the *app_preinclude.h* header file.
- The pre-compiled binaries for FRDM-KW41Z are optimized for the DCDC buck mode configuration of the board.

6 Known Limitations

- This release supports only the IAR Embedded Workbench and MCUXpresso IDEs and toolchains, the FreeRTOS kernel and a bare-metal non-preemptive task scheduler. Other RTOSes and toolchains supported in the KSDK have not been tested with this release.
- Maximum file path length in Windows® 7 Operating System: Windows OS 7 imposes a 260-character maximum length for file paths. The same limitation influences the command line for build tools in various toolchains, which cannot exceed 8191 characters. When deploying this package, it is recommended to place it in a directory close to the root of the disk drive to prevent the limitations described above. The recommended location is the C:\NXP folder."

7 Documentation Included in this Package

The following connectivity-supporting documentation is included in this package.

- *SMAC Quick Start Guide.pdf*
- *Kinetis SMAC Demo Applications User's Guide.pdf*
- *Kinetis SMAC Reference Manual.pdf*

8   Memory Footprints of SMAC Applications

The following table lists the memory footprint of a typical SMAC-based application:

Application – Connectivity Test **Configuration -** FreeRTOS, IAR Embedded Workbench, FRDM-KW41Z		
	RAM [bytes]	Flash [bytes]
Application	1649	16,962
Kinetis base SDK	462	8,564
Connectivity Framework	4,825	13,655
RTOS	8,672	5,500
PHY	225	7,740
SMAC	79	2,797
Total	**15,912**	**55,222**

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