ISSDK v1.5

Release notes for ISSDK v1.5

Rev. 1.0 — 6 March 2017 Release notes

1 Overview

The IoT Sensing SDK (ISSDK) v1.5 is an optional middleware component included in SDK packages downloaded from MCUXpresso SDK Builder (previously known as Kinetis Expert (KEx)) designed to provide support for Kinetis MCU projects using NXP sensors. ISSDK relies on the SDK 2.0 drivers and project release infrastructure to create a unified user experience. ISSDK v1.5 combines a set of robust Sensor Drivers and Algorithms along with example applications to allow a customer to get started with using NXP sensors quickly.

2 Features

2.1 What is new in ISSDK v1.5

- ISSDK middleware component integrated with MCU SDK 2.0 Rel6 ecosystem.
- ISSDK project generation module updated to support MCUXpresso IDE (RedEye). ISSDK kits sensor and algorithm example projects now supported with MCUXpresso IDE (RedEye).
- Added additional sensor examples:
  - FRDM-KL27Z on-board MAG3110 examples
  - FXAS21002 SPI example
- Added STB-CE host protocol compliant demo sources supported with STB-CE (Freedom Sensor ToolBox – Community Edition).

2.2 Delivered in ISSDK 1.1

- ISSDK middleware component integrated with MCU SDK 2.0 Rel5 ecosystem.
- Adoption of KSDK 2.0 CMSIS driver implementations.
- Added FRDM-K64F-AGM04 kit.
- Created sensor driver for FXPQ3115 pressure/bio-compatible sensor.
- Added FRDMKL27-B3115 kit.
- Added FRDM-KL25Z as an MMA8451 kit.
- Added FRDM-KL27Z as an MMA8451 kit.
- Added FreeRTOS sensor fusion algorithm examples for FRDM-K64F-AGM04.
- Added bare metal sensor fusion algorithm examples for FRDM-K64F-AGM01 and FRDM-K22F-AGM01.
- Added pedometer algorithm example for FRDM-K64F-AGM04.
- Added pedometer algorithm example for FRDM-KL25Z as an MMA8451 Kit and FRDM-KL27Z as an MMA8451 kit.

2.3 Delivered in ISSDK 1.0

- ISSDK middleware component introduced and integrated with MCU SDK 2.0 ecosystem.
- Designed ISSDK middleware component design into MCU SDK 2.0 ecosystem.
- Created sensor drivers for MMA845X, MMA865X, FXLS8471, MMA8491, FXLC95000, FXAS21002, FXOS8700, MMA9553 and MPL3115 sensors.
- Added FRDM-K64F-AGM01 kit.
- Added FRDM-K64F-MULT2B kit.
- Added FRDM-K22F-AGM01 kit.
- Added FRDM-K22F-SA9500 kit.
- Added FRDMKL25-A8471 kit.
- Added FRDMKL25-A8491 kit.
- Added FRDMKL25-P3115 kit.
- Added FreeRTOS *sensor fusion* algorithm examples for FRDM-K64F-AGM01, FRDM-K22F-AGM01 and FRDM-K64F-MULT2B kits.
- Added bare metal *sensor fusion* algorithm examples for FRDM-K64F-MULT2B kit.
- Added pedometer algorithm example for FRDM-K64F-AGM01, FRDM-K22F-AGM01 and FRDM-K64F-MULT2B kits.

2.4 Supported sensors

The following NXP sensors are supported by ISSDK v1.5:

Table 1. Sensors supported by ISSDK v1.5

Sensor part number	Sensor type	Interface	
FXAS21002	Gyroscope	SPI	I^2C
FXLC95000	Intelligent accelerometer	SPI	I^2C
FXLS8471	Digital accelerometer	SPI	I^2C
FXOS8700	Digital accelerometer and magnetometer	SPI	I^2C
MAG3110	Digital magnetometer		I^2C
MMA845X	Digital accelerometer		I^2C
MMA8491	Digital accelerometer		I^2C
MMA865X	Digital accelerometer		I^2C
MMA9553	Intelligent accelerometer		I^2C
MPL3115	Digital pressure		I^2C
FXPQ3115	Pressure/Bio-Compatible		I^2C

2.5 Algorithm support

ISSDK v1.5 supports Sensor Fusion V7.1.0 algorithm deployed as example applications and source code libraries.

ISSDK v1.5 supports a pedometer algorithm deployed as example applications, interface files and a binary library.

3 Development tools

The ISSDK v1.5 is supported with the following development toolchains:

- MCUXpresso IDE (RedEye) v0.0.0_alpha [Build 272]
- Kinetis Design Studio IDE v3.2
- IAR Embedded Workbench for ARM version 7.70.1
- MDK-ARM Microcontroller Development Kit (Keil)® 5.23.0
- Somnium DRT
- Makefiles support with GCC revision v4.9-2015-q3 from ARM Embedded

4 PC configurations

The system configurations required to use ISSDK v1.5 supported development toolchains are as follows:

Table 2. PC configurations

Parameter	Minimum configuration	Recommended configuration
Operating system	Windows 7	
Communications to target hardware	USB port	
Processor speed in GHz	1.8	2.6
RAM in GB	4	8
Free disk space in GB	20	400

5 Supported development systems

ISSDK v1.5 is designed to be distributed as codebases created by MCUXpresso SDK Builder targeting a particular sensor demonstration kit. A sensor demonstration kit is defined as a known combination of Freedom Development Board and Arduino compatible Sensor Shield board. MCUXpresso SDK Builder allows selection of these kits as input configurations to the SDK Builder.

Table 3. Sensor kits supported by ISSDK v1.5

Sensor Kit	Freedom Development Board	Sensor Shield Board
FRDM-K22F-AGM01	FRDM-K22F	FRDM-STBC-AGM01
FRDM-K64F-AGM01	FRDM-K64F	FRDM-STBC-AGM01
FRDM-K64F-MULT2B	FRDM-K64F	FRDM-FXS-MULT2-B
FRMDKL25-A8471	FRDM-KL25Z	FRDMSTBC-A8471
FRDMKL25-A8491	FRDM-KL25Z	FRDMSTBC-A8491
FRDMKL25-P3115	FRDM-KL25Z	FRDMSTBC-P3115
FRDM-K22F-SA9500	FRDM-K22F	FRDM-STBC-SA9500
FRDM-K64F-AGM04	FRDM-K64F	FRDM-STBC-AGM04
FRDMKL27-B3115	FRDM-KL27Z	FRDMSTBI-B3115

Sensor Kit	Freedom Development Board	Sensor Shield Board
FRDM-KL27Z	FRDM-KL27Z	Using on-board MMA8451 Using on-board MAG3110
FRDM-KL25Z	FRDM-KL25Z	Using on-board MMA8451

6 Release contents

Table 4. Release contents

Deliverable	Location	Status
Kits	<install_dir>/boards/<kit_name>	Unchanged
Sensor Driver Examples	<install_dir>/boards/<kit_name>/issdk_examples/sensors	Added FRDM-KL27Z on-board MAG3110 example and FXAS21002 SPI example
Algorithm Examples	<install_dir>/boards/<kit_name>/issdk_examples/algorithms	Unchanged
Board-Kit Specific Configuration	<install_dir>/middleware/issdk_1.5/boardkit	Updated RTE_Device.h and pin mux file to align with MCU-SDK-2.0 Rel6
CMSIS Driver Implementations	<install_dir>/middleware/issdk_1.5/drivers	Unchanged
Documentation	<install_dir>/docs/ISSDK	Updated for ISSDK v1.5
Middleware	<install_dir>/middleware/issdk_1.5	Updated
Sensor Algorithms	<install_dir>/middleware/issdk_1.5/algorithms	Unchanged
Driver Examples	<install_dir>/middleware/issdk_1.5/driverexamples	Added FXAS21002 SPI example
Sensor Drivers	<install_dir>/middleware/issdk_1.5/sensors	Unchanged
ISSDK Specific Drivers	<install_dir>/middleware/issdk_1.5/drivers	Unchanged
CMSIS Driver API Includes	<install_dir>/CMSIS/Driver/Include	Unchanged
Host protocol compliant demo sources	<install_dir>/middleware/issdk_1.5/driverexamples/demos	New

7 Open/Closed defects

7.1 ISSDK v1.5 open defects

There are no open defects in ISSDK v1.5.

7.2 ISSDK v1.5 closed defects

Table 5. ISSDK v1.5 closed defects

Ticket Number	Description	Closed Date
KPSDK-14392	ISSDK generated MCUX example definition XML file has the incorrect CMSIS target path	02/14/2017

Ticket Number	Description	Closed Date
KEX-2111	Multiple Compilation Issues with the MCUX IDE imported ISSDK projects using the generated external manifest xml files	02/16/2017
SSDSW-509	Spurious NMI Interrupt occurs in RD KL25Z Board.	01/24/2017
SSDSW-516	Baremetal Sensor Fusion example missing from the release.	01/30/2017
SSDSW-520	ISSDK application stalls when characters sent to the FRDM-K22F board at baud rates that do not match the configured baud rate in the firmware running on the board.	02/10/2017
SSDSW-521	UART device unable to keep up with transmit requests for data rates exceeding 400 Hz.	02/10/2017
SSDSW-522	While UART transmit packet streaming is active at high data rates exceeding 100 Hz, random UART receive packet corruption or loss of characters is observed	02/16/2017
SSDSW-523	SysTick framework updated to support data rates less than 5 Hz.	02/10/2017

7.3 ISSDK 1.1 closed defects

Table 6. ISSDK 1.1 closed defects

Ticket Number	Description	Closed Date
KPSDK-13269	[ISSDK 1.1 EB1]: PG tool clone feature not identifying ISSDK examples for on-board sensor MMA8451 on FRDM-KL25Z and FRDM-KL27Z boards.	11/28/2016
KPSDK-13270	[ISSDK 1.1 EB1]: PG tool cloning feature not identifying FXPQ3115 example projects of FRDMKL25-B3115 kit.	11/28/2016
KEX-1731	[ISSDK 1.1 EB1]: PG tool not identifying kits and corresponding ISSDK projects in the SDK builder package generated for board configuration with ISSDK optional middleware selected	11/24/2016
SSDSW-422	The ISSDK example application files should be part of the respective generated example projects like KSDK driver examples	11/30/16
SSDSW-435	Links to some of the APIs in APIRM are broken and some data structures do not have brief descriptions	11/22/2016
SSDSW-458	ISSDK middleware driver files name uppercase and lowercase are not aligned	11/18/2016

7.4 ISSDK 1.0 closed defects

Table 7. ISSDK 1.0 closed defects

Ticket Number	Description	Closed Date
KEX-1348	If existing configuration on KEx-Stage not removed before creating new configuration with the same name, the KDS/ATL toolchain project files are corrupted in the generated SDK package.	08/12/16
KEX-1323	The default package name shown in kit configuration should match with kit name	08/18/16
SSDSW-423	KL25Z generated projects have different behaviors from the K22F and K64F generated projects. For the KL25Z, during the initial download, it asks the user to select a valid device to connect.	08/05/16

8 Known issues

8.1 Pedometer project IDE limited to IAR

Due to the inclusion of a binary library and problems with KDS support, the pedometer projects are currently only supported with the IAR IDE.

8.2 Analog sensor support

ISSDK v1.5 does not explicitly support analog sensors, for example, FXLN83XX family. However, the customer may add A/D converter sampling and GPIO control via the existing SDK 2.0 drivers.

Support for 5 VDC parts, such as the analog MPXV5004DP pressure sensor, require support of a native, 5 volt Freedom board. The FRDM-KE15Z has been identified as the expected target. Support for this board in Kinetis SDK 2.0 and support for MPXV5004DP are expected in a future release of ISSDK.

9 Revision history

Table 8. Revision history

Revision number	Date	Description
1.0	20170306	Initial release for ISSDK v1.5

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