

# RN00010

Release notes for ISSDK v1.8

Rev. 1 — 30 November 2021

Release notes

## Document information

Information	Content
Keywords	IoT Sensing SDK, ISSDK, MCUXpresso, middleware
Abstract	Release notes for IoT Sensing SDK (ISSDK) v1.8 middleware



## Revision history

Rev	Date	Description
1	20211130	Initial release for RN00010. This document supercedes ISDK17RN

## 1 Overview

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The IoT Sensing Software Development Kit (ISSDK) is the embedded software framework enabling NXP's digital and analog sensors platforms for IoT applications. ISSDK provides a unified set of sensor support models that target NXP's portfolio of sensors across a broad range of ARM Cortex core-based Microcontrollers. ISSDK is offered as a middleware component in MCUXpresso SDK for supported microcontrollers. ISSDK relies on the SDK 2.x drivers and project release infrastructure to create a unified user experience. ISSDK v1.8 combines a set of robust sensor drivers and algorithms along with example applications to allow a user to get started using NXP sensors quickly.

## 2 Features

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### 2.1 What is new in ISSDK v1.8

- ISSDK middleware component integrated with MCUXpresso SDK 2.11.0 Rel 15 ecosystem.
- ISSDK enablement for FXLS8964AF (Gemini) - 3 Axis Accelerometer.
  - Added FXLS8964AF sensor driver
  - Added FRDM-K22F-A8964 (sensor evaluation kit for FXLS8964AF) and reference examples into MCUXpresso SDK.

### 2.2 What is new in ISSDK v1.7

- ISSDK middleware component integrated with MCUXpresso SDK 2.10.0 Rel 14 ecosystem
- Added ISSDK examples for FreeMASTER Sensor Tool using FreeMASTER communication drivers.
  - Added FXLS8962 ISSDK example project for FreeMASTER Sensor Tool.
  - Added FXOS8700 ISSDK example project for FreeMASTER Sensor Tool.
  - Added MMA8652 ISSDK example project for FreeMASTER Sensor Tool.
- ISSDK enablement on LPCXpresso55S06 (Niobe4 Nano)
  - Added sensors examples for LPCXpresso55S06 custom kit with FRDM-STBC-AGM01 in MCUXpresso
- ISSDK enablement on EVK-MIMXRT1170
  - Added sensors examples for EVK-MIMXRT1170 custom kit with FRDM-STBC-AGM01 in MCUXpresso
- ISSDK enablement on MIMXRT1024-EVK
  - Added sensors examples for MIMXRT1024-EVK custom kit with FRDM-STBC-AGM01 in MCUXpresso
- ISSDK enablement on EVK-MIMXRT595
  - Added sensors examples for EVK-MIMXRT595 custom kit with FRDM-STBC-AGM01 in MCUXpresso
- ISSDK enablement on LPC55S16-EVK (Niobe4 Mini)
  - Added sensors examples for LPCXpresso55S16 custom kit with FRDM-STBC-AGM01 in MCUXpresso
- ISSDK enablement on MIMXRT685-EVK
  - Added sensors examples for MIMXRT685-EVK custom kit with FRDM-STBC-AGM01 in MCUXpresso

- ISSDK enablement on EVKB-IMXRT1050
  - Added sensors examples for EVKB-IMXRT1050 custom kit with FRDM-STBC-AGM01 in MCUXpresso
- ISSDK enablement for EVK-MIMXRT1010
  - Added sensor examples for EVK-MIMXRT1010 custom kit with FRDM-STBC-AGM01 in MCUXpresso
- ISSDK enablement on EVK-MIMXRT1015
  - Added sensors examples for EVK-MIMXRT1015 custom kit with FRDM-STBC-AGM01 in MCUXpresso
- ISSDK enablement on EVK-MIMXRT1020
  - Added sensors examples for EVK-MIMXRT1020 custom kit with FRDM-STBC-AGM01 in MCUXpresso
- ISSDK enablement on EVK-MIMXRT1060
  - Added sensors examples for EVK-MIMXRT1060 custom kit with FRDM-STBC-AGM01 in MCUXpresso
- ISSDK enablement on EVK-MIMXRT1064
  - Added sensors examples for EVK-MIMXRT1064 custom kit with FRDM-STBC-AGM01 in MCUXpresso
- ISSDK enablement for FRDM-K32L3A6
  - Added sensor examples for FRDM-K32L3A6 custom kit with FRDM-STBC-AGM01 in MCUXpresso
- ISSDK enablement for FXPS7250A4 (AMAP) Analog absolute pressure sensor.
  - Added FXPS7250A4 sensor driver
  - Added sensor example for FRDM-KE15Z kit with FRDMSTBA-PA7250 in MCUXpresso
- ISSDK enablement on LPC55S69-EVK (Niobe4)
  - Added sensors examples for LPCXpresso55S69 custom kit with FRDM-STBC-AGM01 in MCUXpresso
- ISSDK enablement on MEK-MIMX8QM
  - Enabled on-board sensors (FXOS8700, FXAS21002, MPL3115, ISL29023) examples for MEK-MIMX8QM in MCUXpresso
- Added MCUXpresso IDE support for pedometer examples for kits based on FRDM-STBC-AGM01, FRDM-STBC-AGM04 and FRDM-STBC-MULT2-B, and on-board sensor kits based on FRDM-KL25Z and FRDM-KL27Z

### 2.3 Delivered in ISSDK v1.6

- ISSDK middleware component integrated with MCU SDK 2.3 Rel7 ecosystem
- ISSDK enablement on EVK-MIMXRT1050
  - Added GPIO abstraction layer
  - Added sensors examples for EVK-MIMXRT1050 custom kit with AGM01 in MCUXpresso
- ISSDK enablement on LPC5411x (Niobe2)
  - Added GPIO abstraction layer
  - Added custom kit examples for AGM01 and AGMP03 in MCUXpresso
- ISSDK enablement on KE15Z
  - Added kit examples for MPXV5004DP in MCUXpresso
  - Added sensor driver and sample applications for MPXV5004DP
  - FRDM-KE15Z analog example project for MPXV5004DP

- Added orientation demos with Host I/O support (AGM01)
- ISSDK enablement on FRDM-K32W042
  - Added GPIO abstraction layer
  - Added sensors examples for FRDM-K32W042 custom kit with AGM01 in MCUXpresso

## 2.4 Delivered in ISSDK v1.5

- ISSDK middleware component integrated with MCU SDK 2.2 Rel6 ecosystem.
- ISSDK project generation module updated to support MCUXpresso IDE (RedEye). ISSDK kits sensor and algorithm example projects are 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).

## 2.5 Delivered in ISSDK v1.1

- ISSDK middleware component integrated with MCU SDK 2.1 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.

## 2.6 Delivered in ISSDK v1.0

- 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.

## 2.7 Supported sensors

The following NXP sensors are supported by ISSDK v1.8:

Table 1. Sensors supported by ISSDK v1.7

Sensor part number	Sensor type	Interface		
		SPI	I <sup>2</sup> C	ADC
<b>FXAS21002C</b>	Gyroscope	✓	✓	—
<b>FXLC95000CL</b>	Intelligent accelerometer	✓	✓	—
<b>FXLS8471QR1</b>	Digital accelerometer	✓	✓	—
<b>FXLS8964AF</b>	3-axis Accelerometer	✓	✓	—
<b>FXLS896xAFR1</b>	Low Power 12-bit 3-axis Digital Accelerometer	✓	✓	—
<b>FXOS8700CQ</b>	Digital accelerometer and magnetometer	✓	✓	—
<b>FXPQ3115BV</b>	Pressure/Bio-Compatible	—	✓	—
<b>FXPS7250A4</b>	Analog absolute pressure sensor, 20 to 250 kPa	—	—	✓
<b>FXPS7250D4</b>	High-performance, high-precision, barometric absolute pressure sensor	—	✓	—
<b>MAG3110</b>	Digital magnetometer	—	✓	—
<b>MMA845xQR1</b>	Digital accelerometer	—	✓	—
<b>MMA8491Q</b>	Digital accelerometer	—	✓	—
<b>MMA8652FCR1</b>	Digital accelerometer	—	✓	—
<b>MMA9553</b>	Intelligent accelerometer	—	✓	—
<b>MPL3115A2</b>	Digital pressure	—	✓	—
<b>MPXV5004DP</b>	Differential and gauge, integrated analog pressure sensor	—	—	✓

## 2.8 Algorithm support

ISSDK v1.8 supports Sensor Fusion V7.2.x algorithm deployed as example applications and source code libraries.

ISSDK v1.8 supports a pedometer algorithm V1.0 deployed as example applications, interface files and a binary library.

### 3 Development tools

The ISSDK v1.8 is supported with the following development toolchains:

- MCUXpresso IDE v11.5.0
- IAR Embedded Workbench for ARM version v9.20.1
- MDK-ARM Microcontroller Development Kit (Keil)<sup>®</sup> v5.36
- *Makefiles* support with GCC revision 10-2021.07 from ARM Embedded

### 4 PC configurations

The system configurations required to use ISSDK v1.8 supported development toolchains are as follows:

Table 2. PC configurations

Parameter	Minimum configuration	Recommended configuration
Operating system	Windows 7 / Windows 10	
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 v1.8 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 a Freedom Development Board and an Arduino compatible Sensor Shield board. MCUXpresso SDK Builder allows selection of these kits as input configurations to the SDK Builder.

The following standard ([Table 3](#)) and custom ([Table 4](#)) sensor kits are supported by ISSDK v1.8:

- Standard sensor kits are official MCU board - sensor shield kits which are available for end user to order from NXP Sensor Evaluation Boards web page.
- Custom sensor kits are board shield pairs which will not be available for end user to order as official MCU board - sensor shield kits (MCU board and sensor shield must be ordered separately).

Table 3. Standard sensor kits supported by ISSDK v1.8

Sensor kit	MCU board	Sensor shield board
FRDM-K22F-A8964	FRDM-K22F	FRDM-STBA-A8964
FRDM-K22F-AGMP03	FRDM-K22F	FRDM-STBC-AGMP03

Table 3. Standard sensor kits supported by ISSDK v1.8...continued

Sensor kit	MCU board	Sensor shield board
FRDM-K22F-AGM01	FRDM-K22F	FRDM-STBC-AGM01
FRDM-K22F-SA9500	FRDM-K22F	FRDM-STBC-SA9500
FRDM-K64F-AGM01	FRDM-K64F	FRDM-STBC-AGM01
FRDM-K64F-AGM04	FRDM-K64F	FRDM-STBC-AGM04
FRDMKE15-DP5004	FRDM-KE15Z	FRDMSTBCDP5004
FRDM-KL25Z	FRDM-KL25Z	Using on-board MMA8451
FRDMKL25-A8471	FRDM-KL25Z	FRDMSTBC-A8471
FRDMKL25-A8491	FRDM-KL25Z	FRDMSTBC-A8491
FRDMKL25-P3115	FRDM-KL25Z	FRDMSTBC-P3115
FRDM-KL27Z	FRDM-KL27Z	Using on-board MMA8451, MAG3110
FRDMKL27-B3115	FRDM-KL27Z	FRDMSTBI-B3115

Table 4. Custom sensor kits supported by ISSDK v1.7

Sensor kit	MCU board	Sensor shield board
FRDM-KE15Z with PA7250	FRDM-KE15Z	FRDM-STBA-PA7250
LPCXpresso55S06 with AGM01	LPCXpresso55S06-EVK	FRDM-STBC-AGM01
EVK-MIMXRT1170 with AGM01	EVK- MIMXRT1170	FRDM-STBC-AGM01
EVK-MIMXRT595 with AGM01	EVK-IMXRT595	FRDM-STBC-AGM01
MIMXRT1024-EVK with AGM01	MIMXRT1024-EVK	FRDM-STBC-AGM01
FRDM-KE15Z with PD7250	FRDM-KE15Z	FRDM-STBA-PD7250
FRDM-KL27Z with A8471	FRDM-KL27Z	FRDM-STBC-A8471
FRDM-KL27Z with P3115	FRDM-KL27Z	FRDM-STBC-P3115
FRDM-KL27Z with A8491	FRDM-KL27Z	FRDM-STBC-A8491
EVKB-IMXRT1050 with AGM01	EVKB-IMXRT1050	FRDM-STBC-AGM01
EVK-MIMXRT1010 with AGM01	EVK-MIMXRT1010	FRDM-STBC-AGM01
EVK-MIMXRT1015 with AGM01	EVK-MIMXRT1015	FRDM-STBC-AGM01
EVK-MIMXRT1020 with AGM01	EVK-MIMXRT1020	FRDM-STBC-AGM01



Table 4. Custom sensor kits supported by ISSDK v1.7...continued

Sensor kit	MCU board	Sensor shield board
EVK-MIMXRT1050 with AGM01	EVK-MIMXRT1050	FRDM-STBC-AGM01
EVK-MIMXRT1060 with AGM01	EVK-MIMXRT1060	FRDM-STBC-AGM01
EVK-MIMXRT1064 with AGM01	EVK-MIMXRT1064	FRDM-STBC-AGM01
FRDM-K32L3A6 with AGM01	FRDM-K32L3A6	FRDM-STBC-AGM01
FRDM-K32W042 with AGM01	FRDM-K32W042	FRDM-STBC-AGM01
FRDM-K64F with MULT2B	FRDM-K64F	FRDM-FXS-MULT2-B
LPCXpresso54114 with AGM01	LPXCpresso54114	FRDM-STBC-AGM01
LPCXpresso55S16 with FRDM-STBC-AGM01	LPCXpresso55S16	FRDM-STBC-AGM01
LPCXpresso55s69 with AGM01	LPCXpresso55s69	FRDM-STBC-AGM01
MEK-MIMX8QM	MEK-MIMX8QM	Using on-board FXOS8700, FXAS21002, MPL3115, ISL29023
MIMXRT685-EVK with FRDM-STBC-AGM01	MIMXRT685-EVK	FRDM-STBC-AGM01

## 6 Release contents

Table 5. Release contents

Deliverable	Location	Status
Kits	<install_dir>/boards/<kit_name>	<ul style="list-style-type: none"> <li>• Added sensor kit for FRDM-K22F and FRDM-STBA-A8964 Gemini evaluation kit.</li> <li>• Added board kits for LPCXpresso55s06, EVK-MIMXRT595, EVK-MIMXRT1170, MIMXRT1024-EVK with FRDM-STBC-AGM01 custom kits</li> <li>• Added board kit for FRDM-KE15Z with FRDM-STBA-PD7250 custom kit</li> <li>• Added board kits for FRDM-KL27Z with FRDM-STBC-A8471, FRDM-STBC-MPL3115, FRDM-STBC-A8491 custom kits</li> <li>• Added board kits for EVKB-IMXRT1050, EVK-MIMXRT1015, EVK-MIMXRT1020, EVK-MIMXRT1060 and EVK-MIMXRT1064 with FRDM-STBC-AGM01</li> <li>• Added board kit for LPCXpresso55s16 with FRDM-STBC-AGM01</li> <li>• Added board kit for LPCXpresso55s69 with FRDM-STBC-AGM01</li> <li>• Added board kit for MEK-MIMX8QM</li> <li>• Added board kit for MIMXRT685-EVK with FRDM-STBC-AGM01</li> </ul>

Table 5. Release contents...continued

Deliverable	Location	Status
Sensor driver examples	<install_dir>/boards/<kit_name>/issdk_examples/sensors	<ul style="list-style-type: none"> <li>• Added sensor out-of-box examples for FRDM-K22F and FRDM-STBA-A8964 Gemini evaluation kit.</li> <li>• Added sensor examples for LPCXpresso55s06, EVK-MIMXRT595, EVK-MIMXRT1170, MIMXRT1024-EVK with FRDM-STBC-AGM01 custom kits</li> <li>• Added sensor example for FRDM-KE15Z with FRDM-STBA-PD7250 custom kit</li> <li>• Added sensor examples for FRDM-KL27Z with FRDM-STBC-A8471, FRDM-STBC-MPL3115, FRDM-STBC-A8491 custom kits</li> <li>• Added sensor examples for EVKB-IMXRT1050, EVK-MIMXRT1015, EVK-MIMXRT1020, EVK-MIMXRT1060 and EVK-MIMXRT1064 with FRDM-STBC-AGM01</li> <li>• Added sensor example for FRDM-KE15Z with FRDM-STBA-PA7250 kit</li> <li>• Added sensor examples for LPCXpresso55s16 with FRDM-STBC-AGM01 custom kit</li> <li>• Added sensor examples for LPCXpresso55s69 with FRDM-STBC-AGM01 custom kit</li> <li>• Added custom kit sensor examples for MEK-MIMX8QM</li> <li>• Added sensor examples for MIMXRT685-EVK with FRDM-STBC-AGM01 custom kit</li> </ul>
Algorithm examples	<install_dir>/boards/<kit_name>/issdk_examples/algorithms	<ul style="list-style-type: none"> <li>• Added Pedometer example using FXLS8964AF for FRDM-K22F and FRDM-STBA-A8964 Gemini evaluation kit.</li> <li>• Enabled MCUXpresso IDE support for pedometer examples</li> </ul>

Table 5. Release contents...continued

Deliverable	Location	Status
Board kit specific configuration	<install_dir>/middleware/issdk/boardkit	<ul style="list-style-type: none"> <li>• Added board kit files for FRDM-K22F and FRDM-STBA-A8964 Gemini evaluation kit.</li> <li>• Added board kit definition files for LPCXpresso55s06, EVK-MIMXRT595, EVK-MIMXRT1170, MIMXRT1024-EVK with FRDM-STBC-AGM01 custom kits</li> <li>• Added board kit definition files for FRDM-KE15Z with FRDM-STBA-PD7250 custom kit</li> <li>• Added board kit definition files for FRDM-KL27Z with FRDM-STBC-A8471, FRDM-STBC-MPL3115, FRDM-STBC-A8491 custom kits</li> <li>• Added board kit definition files for EVKB-IMXRT1050, EVK-MIMXRT1010, EVK-MIMXRT1015, EVK-MIMXRT1020, EVK-MIMXRT1060 and EVK-MIMXRT1064 with FRDM-STBC-AGM01 custom kits</li> <li>• Added board kit definition files for FRDM-KE15Z with FRDM-STBA-PA7250 kit</li> <li>• Added board kit definition files for FRDM-K32L3A6 with FRDM-STBC-AGM01 custom kit</li> <li>• Added board kit definition files for LPCXpresso55s16 with FRDM-STBC-AGM01 custom kit</li> <li>• Added board kit definition files for LPCXpresso55s69 with FRDM-STBC-AGM01 custom kit</li> <li>• Added board kit definition files for MEK-MIMX8QM custom kit</li> <li>• Added board kit definition files for MIMXRT685-EVK with FRDM-STBC-AGM01 custom kit</li> </ul>
CMSIS driver Implementations	<install_dir>/middleware/issdk/drivers	Unchanged
Documentation	<install_dir>/docs/ISSDK	Updated for ISSDK v1.8
Middleware	<install_dir>/middleware/issdk	Updated

Table 5. Release contents...continued

Deliverable	Location	Status
Sensor algorithms	<install_dir>/middleware/issdk/algorithms	Added MCUXpresso IDE support for pedometer examples
Driver examples	<install_dir>/middleware/issdk/driverexamples	<ul style="list-style-type: none"> <li>• Added FXLS8964AF sensor examples.</li> <li>• Added FXPS7250A4 (AMAP) sensor example</li> <li>• Added FXPS7250D4 (DBAP) sensor example</li> <li>• Added FXLS8962 FreeMASTER Sensor tool example.</li> <li>• Added FXOS8700 FreeMASTER Sensor tool example.</li> <li>• Added MMA8652 FreeMASTER Sensor tool example.</li> </ul>
Sensor drivers	<install_dir>/middleware/issdk/sensors	<ul style="list-style-type: none"> <li>• Added FXLS8964AF sensor driver.</li> <li>• Added FXPS7250D4 (DBAP) sensor driver</li> </ul>
ISSDK specific drivers	<install_dir>/middleware/issdk/drivers	Unchanged
CMSIS Driver API Includes	<install_dir>/CMSIS/Driver/Include	Unchanged
Host protocol compliant demo sources	<install_dir>/middleware/issdk/driverexamples/demos	Unchanged

## 7 Open/Closed defects

### 7.1 ISSDK v1.8 open defects

There are no open defects in ISSDK v1.8.

### 7.2 ISSDK v1.8 closed defects

There are no closed defects in ISSDK v1.8 (no open defects reported in ISSDK v1.7).

## 8 Known Issues

There are no known issues in this software release. For known issues in MCUXpresso SDK 2.11.0 Rel 15, refer to the release notes for MCUXpresso SDK.

## 9 Legal information

### 9.1 Definitions

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Please be aware that important notices concerning this document and the product(s) described herein, have been included in section 'Legal information'.

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