



Sensor Toolbox: The Complete Hardware and Software Ecosystem for NXP Sensors

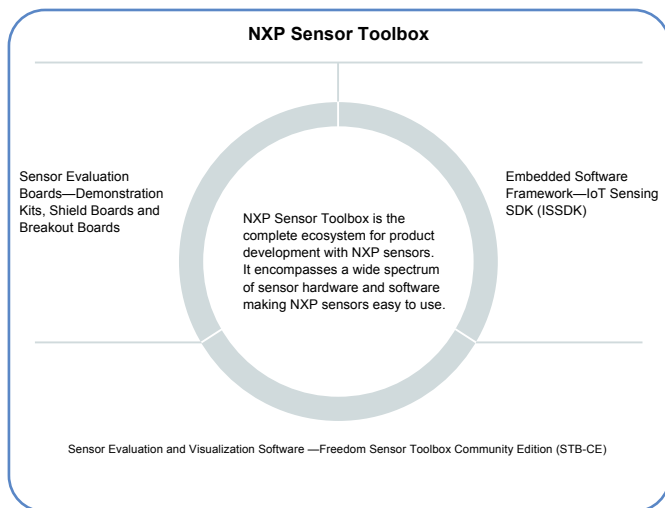
OVERVIEW

NXP® Sensor Toolbox is a complete ecosystem for product development with NXP sensors targeted towards IoT, Industrial, Medical applications. It encompasses a wide spectrum of sensor boards and software tools for various, compatible, Arm® Cortex®-M based microcontrollers (Kinetis®, LPC, i.MX RT). This ecosystem provides out-of-box sensor demonstrations and enables evaluation, application development and prototyping. The variety and breadth of the NXP sensor and microcontroller portfolio means that the Sensor Toolbox can be used to address sensing needs across a wide range of use cases.

www.nxp.com/sensortoolbox

WHAT IS THE SENSOR TOOLBOX?

The Sensor Toolbox helps enable customers to achieve quick time-to-market products with NXP sensors targeted towards IoT, Industrial, Medical applications. The Sensor Toolbox includes evaluation boards, an embedded software framework and an evaluation/visualization software.



HARDWARE: SENSOR EVALUATION BOARDS

Sensor Toolbox provides sensor enablement hardware including a demonstration kit, shield development board and breakout board. This hardware can be combined with different sensors from NXP.

Demonstration Kit (Shield + Microcontroller)

- Combination of a sensor shield development board and a Arduino® I/O pin-compatible microcontroller development board
- Complete solution for quick sensor demonstrations and evaluations, using the Sensor Tool Box-Community Edition (STB-CE) software



Sensor Shield Development Board

- Pin compatible across most Arduino I/O pin compatible microcontroller development boards
- Pins available as test points for evaluating pin signals such as VDD, GND, I²C, SPI, INT, etc.



Breakout Board

- Small form factor with identical shield design, suitable for product prototyping
- Test points, not only for pin signal evaluation, but also for wiring the board to the host MCU



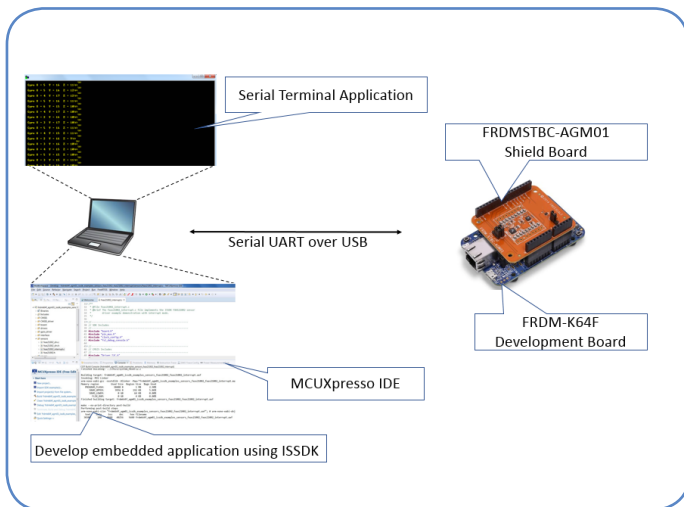
EMBEDDED SOFTWARE FRAMEWORK

The IoT Sensing Software Development Kit (ISSDK) is the embedded software framework for the Sensor Toolbox ecosystem 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 NXP's Arm Cortex-M based microcontrollers including NXP's LPC, Kinetis and i.MX RT crossover platforms. ISSDK combines a set of robust sensor drivers and algorithms along with example applications to allow users to get started using NXP sensors. ISSDK is offered as a middleware option in [MCUXpresso Configuration Tools](#).

- Enables rapid prototyping and production applications using NXP sensors
- Leverages MCUXpresso SDK (Kinetis, LPC and i.MX RT SDK) drivers and cloud-based release infrastructure.
- Supports multiple toolchains: MCUXpresso IDE, IAR, Keil® MDK, Arm GCC
- Host OS supported: Windows®, Mac® and Linux® OS
- Supports bare metal development and FreeRTOS™
- Reference algorithm examples, libraries and interfaces are available for applications such as sensor fusion and pedometer
- Supports sensor data visualization and data analysis using STB-CE software

Refer to [ISSDK Release Notes](#) for more information on list of sensors and evaluation kits supported

EMBEDDED APPLICATION DEVELOPMENT USING ISSDK



Get started with embedded application development here: [Getting started with ISSDK](#)

EVALUATION AND VISUALIZATION SOFTWARE

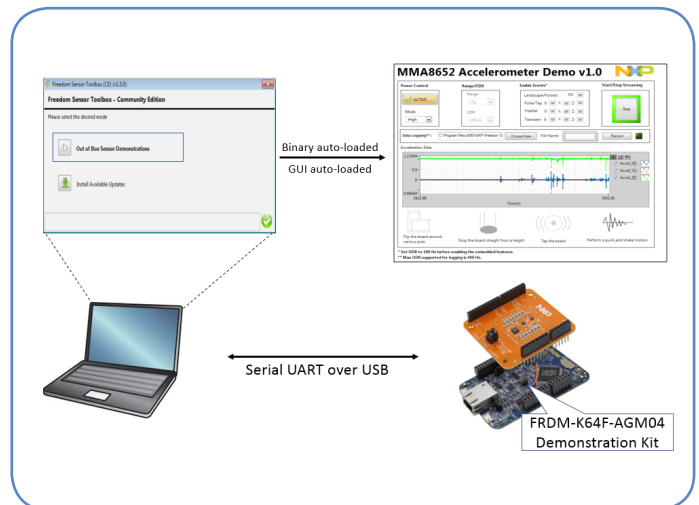
Sensor Toolbox-Community Edition (STB-CE) is visualization and evaluation software for Sensor Toolbox. It enables quick and easy sensor demonstration, evaluation, and sensor data analysis.

Quick demonstration and evaluation are enabled on the available sensor demonstration kits, providing a plug-and-play experience.

- Quick sensor demonstration: enables quick visualization of sensor data and other sensor outputs based on the pre-configured sensor settings in the firmware
- Real-time sensor evaluation: enables easy changes to critical sensor settings (ODR, FSR, power modes) and data logging during sensor demonstrations
- Register level interface: provides a register map for the sensors allowing quick read and write of different register bits, enabling detailed sensor evaluation

Refer to [STB-CE Release Notes](#) for more information on list of sensors and evaluation kits supported

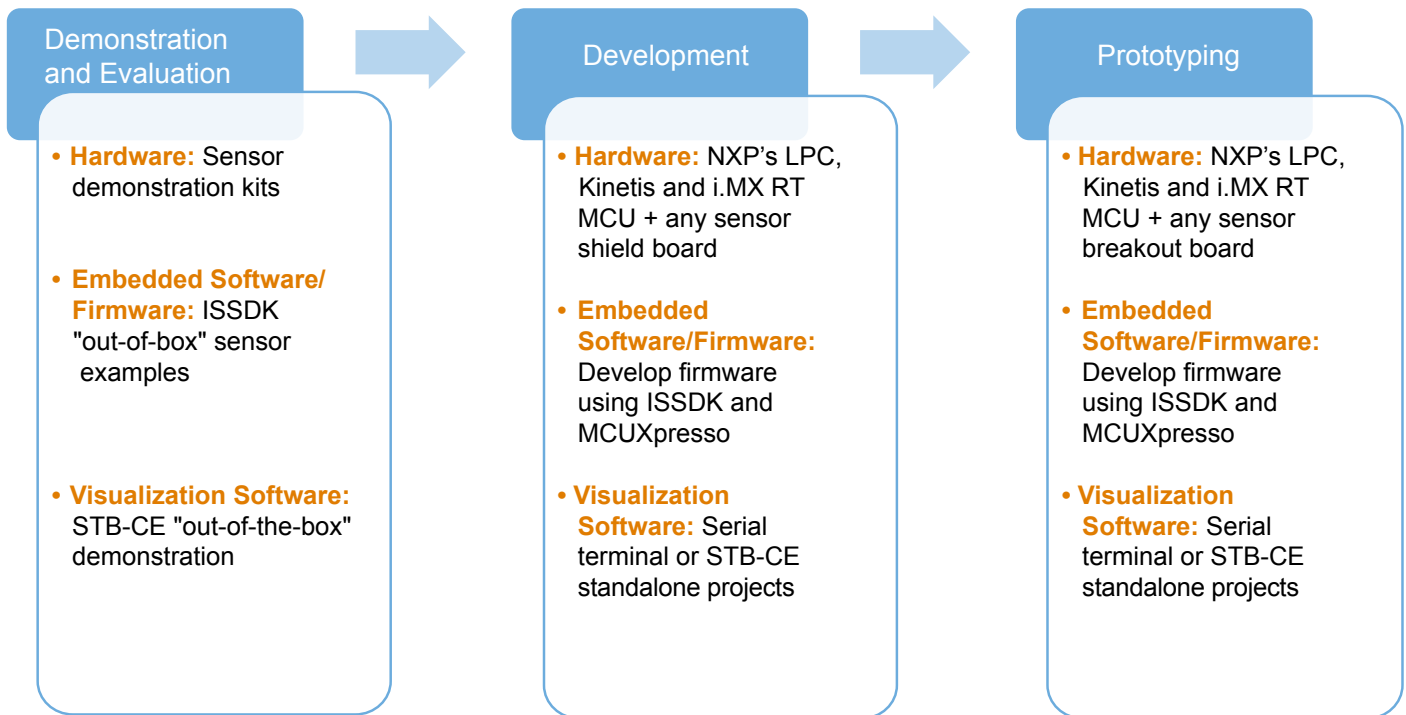
QUICK SENSOR DEMONSTRATION USING STB-CE



Get started with out of the box sensor demonstrations here: [Getting started with STB-CE](#)

HOW DOES THE SYSTEM COME TOGETHER TO DEVELOP YOUR PRODUCTS?

Sensor Toolbox combines hardware and software to facilitate product development.



NXP provides a wide range of sensor boards for different NXP sensors. The table below covers all boards with complete software support for different phases of product development with various NXP sensors and their combinations.

Sensor Toolbox Name	Board Type	Board Name	Accelerometer						Gyroscope	Magnetometer		Pressure			Software	
			FXLC95000CL*	FXLS8471Q	FXOS8700CQ	MMA8451Q	MMA8491Q	MMA8652Q	MMA9553L*	FXAS21002C*	FXOS8700CQ	MAG3110*	FXPQ3115BVTI	MPL3115A2	MPXV5004DP	ISSDK
Sensor Toolbox for 9-Axis Solution (1)	Demo kit	FRDM-K22F-AGM01														
		FRDM-K64F-AGM01														
	Shield board	FRDM-STBC-AGM01			✓			✓	✓						✓	✓
	Breakout board	BRKT-STBC-AGM01														
Sensor Toolbox for 9-Axis Solution (2)	Demo kit	FRDM-K64F-AGM04														
	Shield board	FRDM-STBC-AGM04					✓	✓		✓					✓	✓
	Breakout board	BRKT-STBC-AGM04														
Sensor Toolbox for FXLC95000CL Intelligent Motion Sensor	Demo kit	FRDM-K22F-SA9500														
	Shield board	FRDM-STBC-SA9500	✓												✓	✓
	Breakout board	BRKT-STBC-SA9500														
Sensor Toolbox for MMA8451 3-Axis Linear Accelerometer	Demo kit	FRDM-KL25Z FRDM-KL27Z														
	Shield board	FRDMSTBC-A8451				✓									✓	✓
	Breakout board	BRKTSTBC-A8451														
Sensor Toolbox for FXLS8471Q 3-Axis linear Accelerometer	Demo kit	FRDMKL25-A8471														
	Shield board	FRDMSTBC-A8471		✓											✓	✓
	Breakout board	BRKTSTBC-A8471														
Sensor Toolbox for MMA8491Q 3-Axis Digital Accelerometer	Demo kit	FRDMKL25-A8491														
	Shield board	FRDMSTBC-A8491					✓								✓	✓
	Breakout boards	BRKTSTBC-A8491														
Sensor Toolbox for MAG3110	Demo kit	FRDM-KL27Z								✓				✓	✓	
Sensor Toolbox for FXPQ3115BVT1 High Precision Biocompatible Pressure Sensor	Demo kit	FRDMKL27-B3115 Q42017														
	Shield board	FRDMSTBI-B3115 Q42017										✓			✓	✓
	Breakout board	BRKTSTBI-B3115 Q42017														
Sensor Toolbox for MPL3115A2 Pressure Sensor/ Altimeter	Demo kit	FRDMKL25-P3115														
	Shield board	FRDMSTBC-P3115											✓		✓	✓
	Breakout board	BRKTSTBC-P3115														
Sensor Toolbox for MPXV5004DP Analog Pressure Sensor	Shield board	FRDMSTBCDP5004														
	Breakout board	BRKTSTBCDP5004											✓			✓
Sensor Expansion board for multiple sensors	Shield board	FRDM-FXS-MULT2-B		✓	✓			✓	✓	✓	✓			✓	✓	
10 axis data logger Reference design	Reference design	RD-KL25-AGMP01			✓			✓	✓	✓		✓		✓	✓	

* Part is End-of-Life (EOL). Ecosystem supported with evaluation boards and software.

Find all the above sensor boards here: [nxp.com/sensorevaluationboards](https://www.nxp.com/sensorevaluationboards)

www.nxp.com/sensortoolbox

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Document Number: SNRSOLUTNTMFS REV 10