STB-CE v2.5

Release notes for STB-CE v2.5

Rev. 3 — 10 May 2018 Release notes

1 Overview

The Freedom Sensor Toolbox-Community Edition (STB-CE) is the visualization and evaluation software in the Sensor Toolbox ecosystem. It enables quick and easy sensor demonstration and evaluation with NXP sensors. This software is fully integrated with the IoT Sensing SDK embedded software framework.

The latest version of STB-CE, version 2.5, introduces many new features for enhancing the out of box demonstration and evaluation experience for a wide variety of NXP sensors. Some of the key highlights include an updated auto-detection mechanism for Windows 10 machines, installation upgrades, LabVIEW 2017 upgrade, improved data logging and reduced CPU utilization. This version also launches support for three new sensors: NPS300x differential pressure sensor, MMA8452 accelerometer and FXPQ3115BV bio-compatible medical pressure sensor, and QN9080DK development board.

2 Features

2.1 What's new in STB-CE v2.5

- **Updated bootloader support for Windows 10 machines**
  Updated the auto-detection mechanism of STB-CE to support the latest Windows 10 compatible OpenSDA bootloaders and firmware applications. This ensures appropriate auto-detection of sensor evaluation boards on Windows 10 machines.
- **LabVIEW Run-time engine upgrade**
  Upgraded the LabView Run-Time engine from 2014 version to 2017 version to enhance the performance and error handling.
- **Sensor Toolbox installation upgrade**
  - New package installer window: Updated the installation process to display a package installation window with the detailed progress of each package/project installation. The installer window enhances the user awareness of the installation process.
  - Improved error handling: Updated the package installation process to avoid stalling due to errors during the process. Erroneous package names are instead consolidated and listed for the user at the end so the user can manually install the package again if needed.
- **Improved maximum CPU utilization**
  Reduced the maximum CPU utilization of STB-CE by ~50% by optimizing each GUI and its corresponding plugins. This improvement can be specifically observed at the highest sampling rates in each GUI.
- **Data logging upgrade**
  Upgraded the maximum supported sampling rate for data logging in GUIs from 400 Hz to 800 Hz.

- **"Install Available Updates" optimization**
  Optimized the server download process of "Install Available Updates" to improve the RAM usage. The improvement avoids installer crashes and provides a quicker download.
- **New sensor support**
  Support added for the NPS300x differential pressure sensor, MMA8452 accelerometer and FXPQ3115BV bio-compatible medical pressure sensor
- **New board support**
  - Added support for QN9080 microcontroller: QN9080DK with FRDM-STBC-AGM01
  - Added support for new kits: FRDMSTBC-A845x with FRDM-K64F, FRDM-KL27Z with FRDM-STBC-AGMP03 and FRDMKE15DP300x and FRDMKL27-B3115.
  - Modified support for FRDM-K64F with FRDM-FXS-MULT2B: Six sensors on the board are now supported, FXAS21002, FXOS8700, MMA8652, MPL3115, FXLS8471 and MAG3110
- **New GUI support**
  MMA845x accelerometer demo (supporting both MMA8451 and MMA8452 sensor demos), NPS300X differential pressure demo and FXPQ3115BV BIO pressure demo

Table 1. Sensor GUI projects and corresponding sensor demonstration kits

Sensor	GUI project name	Demonstration kit[1]
FXL8962AF	FXLS8962 Accelerometer Demo	FRDM-K22F-AGMP03
		LPCXpresso54114 with FRDM-STBC-AGMP03
		FRDM-KW41Z with FRDM-STBC-AGMP03
		FRDM-KL27Z with FRDM-STBC-AGMP03
NPS300x	NPS300X Differential Pressure Demo	FRDMKE15DP300x
FXOS8700, FXAS21002 MMA8652, FXL9862, MAG3110	9 Axis Orientation Sensor Demo	FRDM-K22F-AGMP03
		FRDM-K64F-AGM01
		FRDM-K22F-AGMP03
		FRDM-K64F-AGM04
MPL3115	Digital Pressure Altimeter Demo (MPL3115)	FRDM KL25Z-P3115
		FRDM-K22F-AGMP03
		FRDM-KL27Z with FRDM-STBC-AGMP03
		LPCXpresso54114 with FRDM-STBC-AGMP03
		FRDM-K64F with FRDM-FXS-MULT2B
		FRDM-KW41Z with FRDM-STBC-AGMP03
FXOS8700	FXOS8700 6-axis (Accel, Mag) Demo	FRDM-K64F-AGM01
		FRDM-K22F-AGM01
		FRDM-K64F with FRDM-FXS-MULT2B
		QN9080DK with FRDM-STBC-AGM01
		LPCXpesso54114 with FRDM-STBC-AGM01
FXPQ3115BV	FXPQ3115BV BIO Pressure Demo	FRDMKL27-B3115

Sensor	GUI project name	Demonstration kit[1]
FXAS21002	FXAS21002 Gyroscope Demo	FRDM-K22F-AGM01
		FRDM-K64F-AGM01
		FRDM-K64F-AGM04
		LPCXpresso54114 with FRDM-STBC-AGM01
		FRDM-K64F with FRDM-FXS-MULT2B
		FRDM-K22F-AGMP03
		FRDM-KL27Z with FRDM-STBC-AGMP03
		LPCXpresso54114 with FRDM-STBC-AGMP03
		QN9080DK with FRDM-STBC-AGM01
		FRDM-KW41Z with FRDM-STBC-AGMP03
		FRDM-K22F-AGMP03
MMA8652	MMA8652 Accelerometer Demo	FRDM-K64F-AGM04
		FRDM-K64F with FRDM-FXS-MULT2B
MMA8491	MMA8491 Accelerometer Demo	FRDM KL25Z-A8491
FXLS8471[2]	FXLS8471 Accelerometer Demo	FRDM KL25Z-A8471
		FRDM-K64F with FRDM-FXS-MULT2B
MMA8451/2	MMA8451 Accelerometer Demo	FRDM-KL25Z
		FRDM-KL27Z
		FRDMSTBC-A845x with FRDM-K64F
MAG3110	MAG3110 Magnetometer Demo	FRDM-K64F-AGM04
		FRDM-KL27Z
		LPCXpresso54114 with FRDM-STBC-AGMP03
		FRDM-KL27Z with FRDM-STBC-AGMP03
		FRDM-K64F with FRDM-FXS-MULT2B
		FRDM-KW41Z with FRDM-STBC-AGMP03
		FRDM-K22F-AGMP03
FXLC95000	FXLC95000 Accelerometer Demo	FRDM-K22F-SA9500
FXOS8700 FXAS21002 MPL3115	Generic Data Logger Demo	RD-KL25-AGMP01

[1] Find sensor demonstration kits on http://www.nxp.com/sensorevaluationboards
[2] SPI enabled demo. All others are I^2C enabled.

2.2 Delivered in STB-CE v2.0

- **Upgraded auto-detection service**
  The user does not need to manually disconnect and reconnect the boards anymore after a firmware download.
- **Reduced GUI launch time**
  The GUI launch time was reduced by 200% to enhance the out-of-box experience.
- **Reduced register read/write time**
  The Register Read/Write time was reduced by 300%. This reduction can be observed significantly in Register Read all operations.
- **Added dynamic GUI scaling feature**
  The GUI can now dynamically scale with different screen sizes and device form factors.
- **Upgraded the host IO protocol**
  The host IO communication between the tool and the demo kit was improved to make it more robust and less prone to UART based errors.
- **Added Windows 10 support**
  STB-CE was fully tested on Windows 10 operating systems.
- **Improved board selection process**
  Added detailed images of all sensor demo kits in the Board selection process. Users can now visually verify if they have the correct sensor demonstration kit.
- **GUI improvements**
  Added the new Offset and Noise feature for sensor parametric analysis. Also, added a single button for both Stream Start/Stop and Active/Standby functions.
- **New board support**
  Added support for LPCXPRESSO54114 and FRDM-KW41Z microcontrollers.
  Added support for FRDM-FXS-MULT2B multi sensor board.
- **New GUI support**
  Added a 9-axis sensor orientation GUI for accurate 9-axis orientation detection.

Table 2. Sensor GUI projects and corresponding sensor demonstration kits

Sensor	GUI project name	Demonstration kit[1]
FXL8962AF	FXLS8962 Accelerometer Demo	FRDM-K22F-AGMP03
		LPCXPRESSO54114 with FRDM-STBC-AGMP03
		FRDM-KW41Z with FRDM-STBC-AGMP03
FXOS8700 FXAS21002 MMA8652 FXL9862 MAG3110	9 Axis Orientation Sensor Demo	FRDM-K64F-AGM01
		FRDM-K22F-AGMP03
		FRDM-K64F-AGM04
MPL3115	Digital Pressure Altimeter Demo (MPL3115)	FRDM KL25Z-P3115
		FRDM-K22F-AGMP03
FXOS8700	FXOS8700 6-axis (Accel, Mag) Demo	FRDM-K64F-AGM01
		FRDM-K22F-AGM01
		LPCXPRESSO54114 with FRDM-STBC-AGM01

Sensor	GUI project name	Demonstration kit[1]
FXAS21002	FXAS21002 Gyroscope Demo	FRDM-K22F-AGM01
		FRDM-K64F-AGM01
		FRDM-K64F-AGM04
		LPCXPRESSO54114 with FRDM-STBC-AGM01
		FRDM-K64F with FRDM-FXS-MULT2B
		FRDM-K22F-AGMP03
MMA8652	MMA8652 Accelerometer Demo	FRDM-K64F-AGM04
		FRDM-K64F with FRDM-FXS-MULT2B
MMA8491	MMA8491 Accelerometer Demo	FRDM KL25Z-A8491
FXLS8471[2]	FXLS8471 Accelerometer Demo	FRDM KL25Z-A8471
MMA8451	MMA8451 Accelerometer Demo	FRDM-KL25Z
		FRDM-KL27Z
MAG3110	MAG3110 Magnetometer Demo	FRDM-K64F-AGM04
		FRDM-KL27Z
		FRDM-K22F-AGMP03
FXLC95000	FXLC95000 Accelerometer Demo	FRDM-K22F-SA9500
FXOS8700 FXAS21002 MPL3115	Generic Data Logger Demo	RD-KL25-AGMP01

[1] Find sensor demonstration kits on http://www.nxp.com/sensorevaluationboards
[2] SPI enabled demo. All others are I^2C enabled.

2.3 Delivered in STB-CE v1.5

- **Added ISSDK support**
  - Added support for IoT Sensing SDK (ISSDK) - embedded software framework.
  - All STB-CE demos are now enabled by ISSDK firmware.
- **Upgraded auto-detection service**
  - The auto-detection service enables quick and easy out of box demonstrations with standard NXP sensor demo kits.
- **Added register screen page**
  - Provides an easy and intuitive interface for detailed register level evaluation.
  - Provides the complete register map for each sensor with detailed bit descriptions.
  - Enables quick read and write to single/multiple registers or parameters with ease.
  - Enables saving application specific register configurations and loading it for later use
  - I^2C and SPI interfaces are supported.
- **Added real-time sensor evaluation**
  - GUIs allow a user to make sensor configuration changes in the forms. This enables making quick changes to critical sensor settings and then streaming or logging data to view the updated results.

- **Removed create your own GUI**
  - Improves tool performance and ease of use
- **Added support for additional sensors/sensor demo kits**
  - Provides support for the following NXP sensors/sensor demo kits:

Table 3. Sensor GUI projects and corresponding sensor demonstration kits

Sensor	GUI project name	Demonstration kit[1]
MMA8652	MMA8652 Accelerometer Demo	FRDM-K64F-AGM04
MPL3115	Digital Pressure Altimeter Demo (MPL3115)	FRDM KL25Z-P3115
FXOS8700	FXOS8700 6-axis (Accel, Mag) Demo	FRDM-K64F-AGM01
		FRDM-K22F-AGM01
FXAS21002	FXAS21002 Gyroscope Demo	FRDM-K22F-AGM01
		FRDM-K64F-AGM01
		FRDM-K64F-AGM04
FXLS8962	FXLS8962 Accelerometer Demo	FRDM-K22F-AGMP03
MMA8491	MMA8491 Accelerometer Demo	FRDM KL25Z-A8491
FXLS8471[2]	FXLS8471 Accelerometer Demo	FRDM KL25Z-A8471
MMA8451	MMA8451 Accelerometer Demo	FRDM-KL25Z
		FRDM-KL27Z
FXLC95000	FXLC95000 Accelerometer Demo	FRDM-K22F-SA9500
MAG3110	MAG3110 Magnetometer Demo	FRDM-K64F-AGM04
		FRDM-KL27Z
FXOS8700 FXAS21002 MPL3115	GENERIC-DATA-LOGGER	RD-KL25-AGMP01

[1] Find sensor demonstration kits on http://www.nxp.com/sensorevaluationboards
[2] SPI enabled demo. All others are I^2C enabled.

2.4 Delivered in STB-CE v1.0.4

- **ISF support**
  STB-CE demos enabled by ISF firmware
- **Auto-detection service**
  The auto-detection service enables out of box demos with NXP sensor demo kits
- **Create your own GUI**
  This feature enables creation of user-specific GUIs using widgets and plug-ins.
- **Support for sensors/sensor demo kits**
  Provides support for the following NXP sensors/sensor demo kits:

Table 4. Sensor GUI projects and corresponding sensor demonstration kits

Sensor	GUI project name	Demonstration kit[1]
MPL3115	Digital Pressure Altimeter Demo	FRDM KL25Z-P3115
MMA8491	MMA8491 Accelerometer Demo	FRDM KL25Z-A8491
FXLS8471[2]	FXLS8471 Accelerometer Demo	FRDM KL25Z-A8471
FXLC95000	FXLC95000 Accelerometer Demo	FRDM-K22F-SA9500

Sensor	GUI project name	Demonstration kit[1]
FXOS8700 FXAS21002 MPL3115	Generic Data Logger	RD-KL25-AGMP01
FXOS8700 FXAS21002	STB-CE Kit	FRDM-K64F-AGM01

[1] Find sensor demonstration kits on http://www.nxp.com/sensorevaluationboards
[2] SPI enabled demo. All others are I^2C enabled.

3 Minimum and recommended system configurations

The system requirements for running STB-CE on PCs are as follows:

Table 5. System requirements

Parameter	Minimum configuration	Recommended configuration
Operating system	Windows 7 and 10	
Communications to target hardware	USB port	
Processor speed in GHz	1.8	2.6
RAM in GB	2	4
Free disk space in GB	20	400

4 Open/closed defects

4.1 STB-CE v2.5 open defects

For the demo kits FRDM KL25Z-P3115 and FRDMKL27-B3115, the digital pressure altimeter demo (MPL3115) and the FXPQ3115BV BIO pressure demo may not work as expected the first time. The sampling rate may not correspond to the configured rate in the GUI and requires a board reset for proper functionality. The second GUI launch after the board reset will work appropriately.

4.2 STB-CE v2.5 closed defects

Table 6. STB-CE v2.5 closed defects

Description	Closed date
The GUIs of STB-CE do not start streaming when the Start button is clicked.	20180510
Switching from a 9-axis Orientation Demo to another GUI causes unexpected behavior.	20180510

4.3 STB-CE v2.0 closed defects

Table 7. STB-CE v2.0 closed defects

Description	Closed date
Loading Freedom Sensor Toolbox(CE) progress window remains open.	20170914

4.4 STB-CE v1.5 closed defects

There are no closed defects in STB-CE v1.5.

5 Revision history

Table 8. Revision history

Revision number	Date	Description
v.3	20180510	Revised document corresponding to version 2.5.
v.2	20170914	Revised document corresponding to version 2.0.
v.1	20170327	Initial version of the document corresponding to version 1.5.0.

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