STEVAL-IDB007V1 evaluation board quick start guide

Introduction

The STEVAL-IDB007V1 is an evaluation board based on BlueNRG-1, a low power Bluetooth® Smart System on Chip that is compliant with the Bluetooth® v4.1 specification and supports both master and slave roles.

Figure 1: STEVAL-IDB007V1 Bluetooth® low energy evaluation board

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1 Getting started

The evaluation board is preprogrammed with sensor profile firmware (BLE_SensorDemo.hex) which allows to set and establish a connection with a smartphone (iOS or Android) running a BlueNRG sensor application which works with the sensor profile firmware running on the STEVAL-IDB007V1 evaluation board.

The sensor profile firmware implements a proprietary Bluetooth profile which exposes two services: acceleration and environmental service.

The acceleration service contains the following characteristics:

- Acceleration: it gives the current value of the acceleration detected by the MEMS sensor on the STEVAL-IDB007V1 board.
- Free fall characteristic: it allows detection of free-fall condition by the LSM6DS3 MEMS sensor on the STEVAL-IDB007V1 board (the condition is detected if the acceleration on the 3 axes is near zero for a certain amount of time).

The environmental service contains characteristics that expose data from some environmental sensors, such as temperature sensors.

1.1 Powering up STEVAL-IDB007V1 evaluation board running the sensor profile firmware (peripheral role)

Two power options are available:

- **Batteries** - To power the STEVAL-IDB007V1 evaluation board using batteries, 2 AAA batteries must be inserted into the battery holder at the rear of the board, and jumper JP1 set to position 2-3 and jumper JP2 set to position 1-2 (*Figure 2: "STEVAL-IDB007V1 power options"*).
- **USB** - To power the STEVAL-IDB007V1 evaluation board through USB, jumper JP1 must be in position 1-2 and jumper JP2 set to position 2-3 (*Figure 2: "STEVAL-IDB007V1 power options"*). Connect a USB cable to the micro-USB connector (*Figure 2: "STEVAL-IDB007V1 power options"*) and to a PC USB port.

Once powered, the STEVAL-IDB007V1 sensor profile firmware starts advertising, waiting for a smartphone to connect to it.

Figure 2: STEVAL-IDB007V1 power options
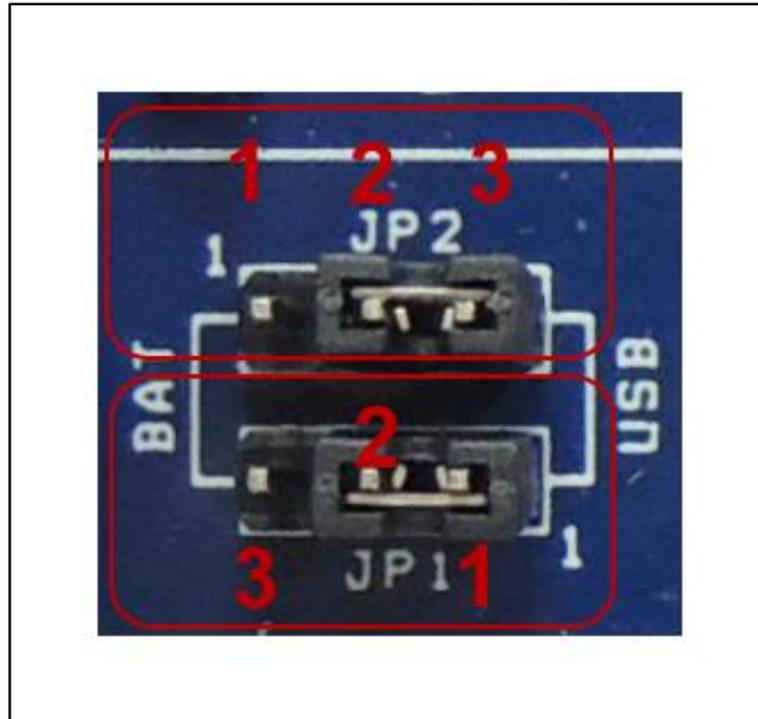
1.2 Install the BlueNRG app for smartphones (central role)

- Two versions (Android and iOS) of the smartphone sensor application are available for download on the specific web pages (*Table 1: "Reference information"*Android & iOS SensorApp).
- Install the smartphone SensorApp application on the selected smartphone.

1.3 Run BlueNRG app for smartphones

- Launch the BlueNRG SensorApp application on the smartphone
- It starts scanning for the BlueNRG sensor peripheral. A device called "BlueNRG" appears on the screen (this is the STEVAL-IDB007V1 running the sensor profile firmware)
- Tap on the BlueNRG name to connect to the STEVAL-IDB007V1 running the sensor profile firmware. The BlueNRG SensorApp application enables notifications on the acceleration characteristic and displays the received value on the screen.

Figure 3: Smartphone BlueNRG SensorApp acceleration notification

GSPG0306141145SG

- Data from environmental sensors are also periodically read and displayed.

Figure 4: Smartphone BlueNRG SensorApp RSSI notifications

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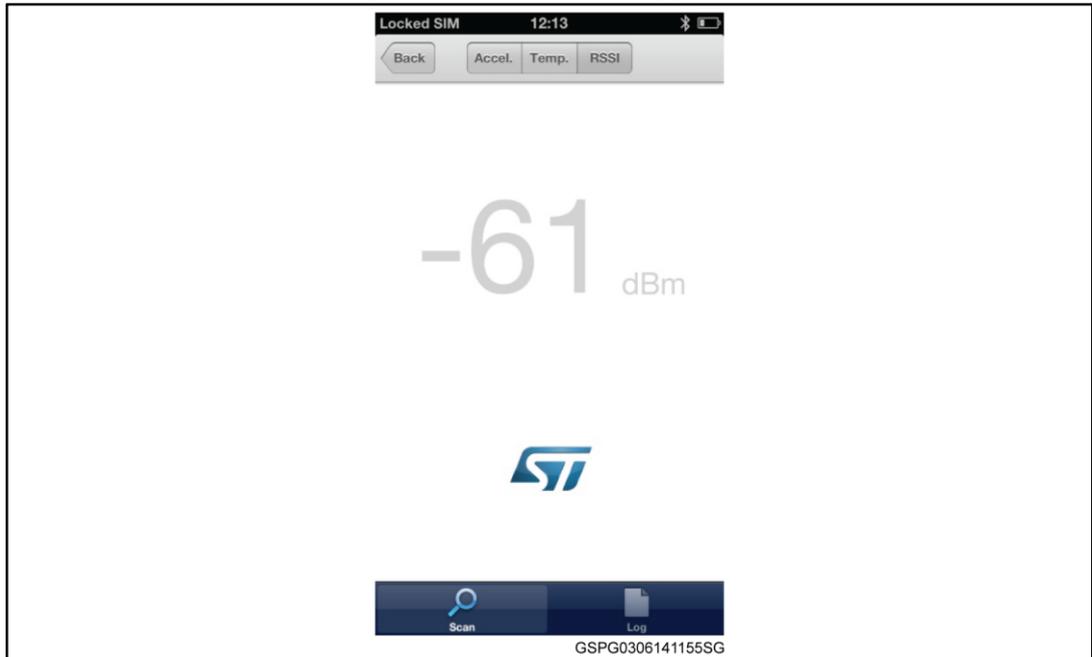
2 SW demonstration applications

- In order to develop a software application for the STEVAL-IDB007V1 evaluation board, it is recommended to start with the reference demonstration applications provided within the BlueNRG-1 DK software package (STSW-BLUENRG1-DK) available on the STEVAL-IDB007V1 web page.
- Unzip the file, launch the related installer and follow installation steps (the default installation path is C:\\Program Files (x86)\\STMicroelectronics\\BlueNRG-1 DK x.x.x)
- Wait for the package installation to complete.
- The Projects folder in BlueNRG-1 DK SW package contains the available BlueNRG-1 demonstration applications, IAR projects, sources and header files.
- IAR Embedded Workbench for ARM (EWARM) tool is needed for building and downloading software applications running on the BlueNRG-1 microcontroller.

For a description of the available BlueNRG-1 demonstration applications and supported platforms, refer to BlueNRG-1 development kits user manual available on the related web page. The BLE_SensorDemo.hex prebuilt binary image is also provided within the BlueNRG-1 DK software package, in the Firmware folder.

Keil MDK-ARM and Atollic TrueStudio for ARM (GCC) toolchains projects are also available.

3 References

Table 1: Reference information

What	Where	Description
BlueNRG-1 Bluetooth Low Energy wireless System on Chip	www.st.com/bluenrg-1	BlueNRG-1 device web page
Bluetooth Low Energy Specification	https://www.bluetooth.org/en-us/specification/adopted-specifications	Bluetooth Low Energy specification web page
Smartphone Android 4.3 Sensor App	https://play.google.com/store/apps/details?id=com.st.blunrg	Android 4.3 BlueNRG Sensor App web page
Smartphone IoS Sensor App	https://itunes.apple.com/us/app/bluenrg/id705873549?l=it&ls=1&mt=8	IoS BlueNRG Sensor App web page
STSW-BLUENRG1-DK	STEVAL-IDB007V1 web page, Tools and Software section	BlueNRG-1 DK SW package with reference demonstration applications
STEVAL-IDB007V1	*www.st.com/bluenrg-1*, Evaluation Tools section	STEVAL-IDB007V1 platform web page

4 List of acronyms

Table 2: List of acronyms used in the document

Term	Meaning
BLE	Bluetooth Low Energy
DK	Development kit
SW	Software
USB	Universal serial bus

5 Revision history

Table 3: Document revision history

Date	Revision	Changes
14-Jul-2016	1	Initial release.

IMPORTANT NOTICE – PLEASE READ CAREFULLY