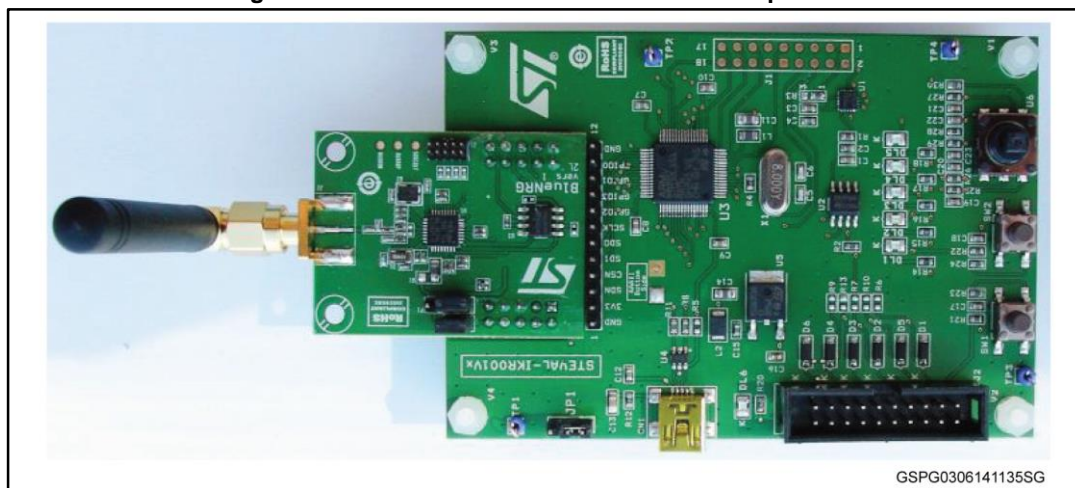STEVAL-IDB002V1 evaluation board quick start guide

Introduction

The STEVAL-IDB002V1 is an evaluation board based on BlueNRG, a low power Bluetooth® Smart IC that is compliant with the Bluetooth® v4.0 specification and supports both master and slave roles.

The STEVAL-IDB002V1 platform features an on-board STM32L low power microcontroller. It can be used to explore the BlueNRG features and as a development platform for Bluetooth® Smart applications running on the STM32L microcontroller and interfacing to the BlueNRG network coprocessor.

Figure 1: STEVAL-IDB002V1 Bluetooth® Smart platform

Contents

1 Getting started

The STEVAL-IDB002V1 evaluation board is preprogrammed with sensor profile firmware (SensorDemo.hex) which allows to set and establish a connection with a smartphone (iOS 7 or Android 4.3) running a BlueNRG sensor application which works with the sensor profile firmware running on the STEVAL-IDB002V1 platform.

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 LIS3DH MEMS sensor on the STEVAL-IDB002V1 board.
- Free fall characteristic: it allows detection of free-fall condition by the LIS3DH MEMS sensor on the STEVAL-IDB002V1 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.

> Pressure and humidity characteristics are also defined in order to potentially support pressure and humidity environmental sensors. These sensors can been added through an expansion board connected to the STEVAL-IDB002V1 expansion connector J1 (*Figure 1: "STEVAL-IDB002V1 Bluetooth® Smart platform"* STEVAL-IDB002V1 Bluetooth Smart platform). The expansion board is not included with the STEVAL-IDB002V1.
>
> For more information about the STEVAL-IDB002V1 components, refer to BlueNRG development kits user manual (UM1686) available on STEVAL-IDB002V1 web page.

1.1 Powering up STEVAL-IDB002V1 platform running the sensor profile firmware (peripheral role)

Two power options are available:

- **Batteries** - To power the STEVAL-IDB002V1 platform 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 (*Figure 2: "STEVAL-IDB002V1 power options"* STEVAL-IDB002V1 power options (B)).
- **USB** - To power the STEVAL-IDB002V1 platform through USB, jumper JP1 must be in position 1-2 (*Figure 2: "STEVAL-IDB002V1 power options"* STEVAL-IDB002V1 power options (B)). Connect a USB cable to the mini-USB connector (*Figure 2: "STEVAL-IDB002V1 power options"* STEVAL-IDB002V1 power options (A)) and to a PC USB port.

Once powered, the STEVAL-IDB002V1 sensor profile firmware will start advertising, waiting for a smartphone to connect to it.

Figure 2: STEVAL-IDB002V1 power options
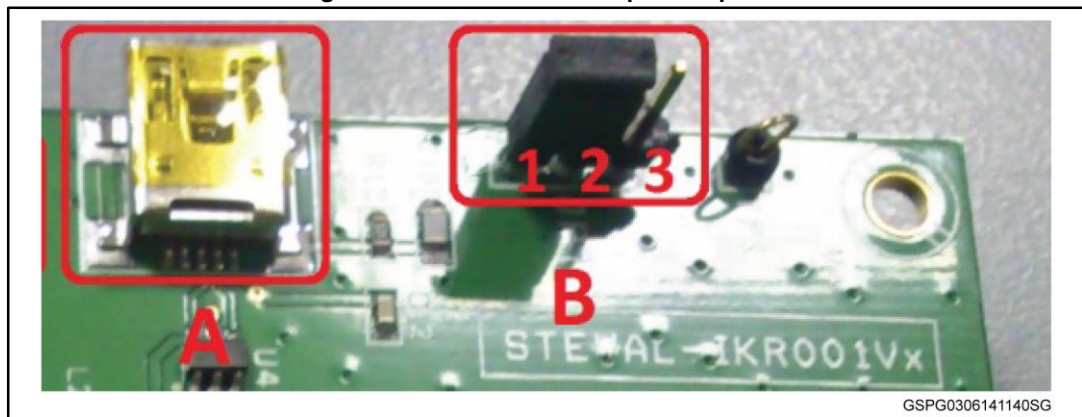
1.2   Install the BlueNRG app for smartphones (Central role)

- Two versions (Android 4.3 and iOS 7) of the smartphone sensor application are available for download on the specific web pages (*Table 1: "Reference information"*, Android 4.3 & 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 will start scanning for the BlueNRG sensor peripheral. A device called "BlueNRG" will appear on the screen (this is the STEVAL-IDB002V1 running the sensor profile firmware)
- Tap on the BlueNRG name to connect to the STEVAL-IDB002V1 running the sensor profile firmware. The BlueNRG SensorApp application will enable notifications on the acceleration characteristic and displays the received value on the screen.

Figure 3: Smartphone BlueNRG SensorApp acceleration notification

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- Data from environmental sensors are also periodically read and displayed.
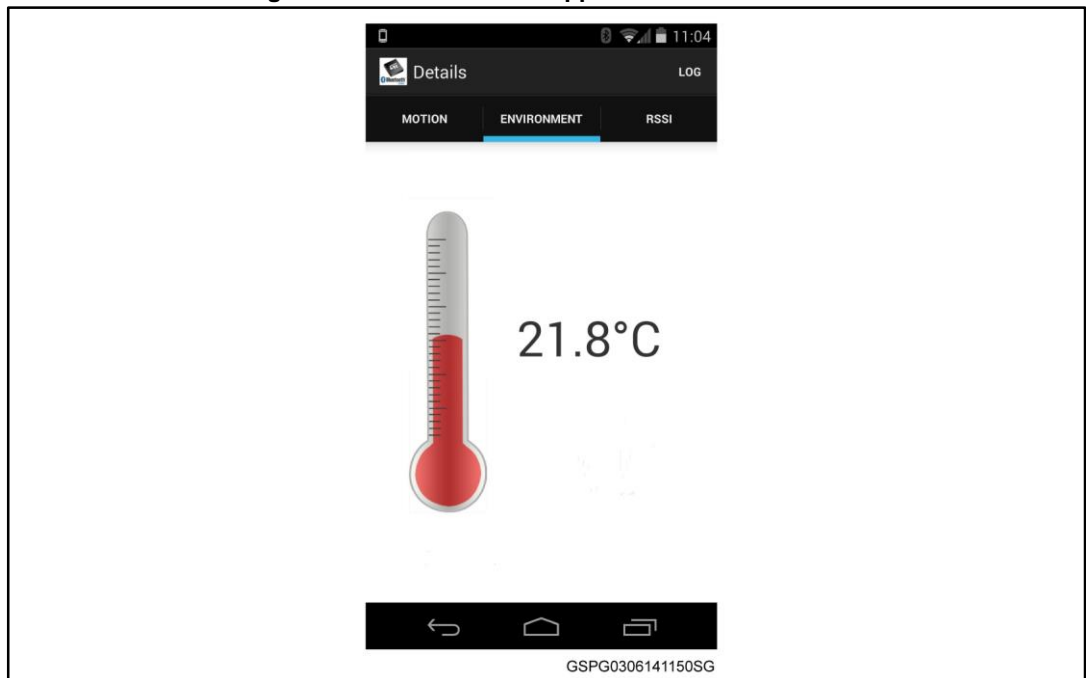
Figure 4: BlueNRG SensorApp environment sensors

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Figure 5: BlueNRG SensorApp RSSI notifications

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2   SW demonstration applications

- In order to develop a software application for the STEVAL-IDB002V1 platform, it is recommended to start with the reference demonstration applications provided within the BlueNRG DK software package available on the STEVAL-IDB002V1 web page (*Table 1: "Reference information"*, STSW-BLUENRG-DK).
- Unzip the file, launch the related installer and follow installation steps (the default installation path is C:\\Program Files (x86)\\STMicroelectronics\\BlueNRG DK x.x.x)
- Wait for the package installation to complete.
- The Projects folder in BlueNRG DK SW package contains the available BlueNRG demonstration applications, IAR projects, sources and header files.
- IAR Embedded Workbench for ARM (EWARM) tool V7.40.3 or later is needed for building and downloading software applications running on the STM32L microcontroller.

> For a description of the available BlueNRG demonstration applications and supported platforms, refer to *Table 1: "Reference information"* (UM1686 user manual).
>
> The SensorDemo.hex prebuilt binary image is also provided within the BlueNRG DK software package, in the Firmware folder.

3 References

Table 1: Reference information

What	Where	Description
BlueNRG Bluetooth Low Energy wireless network processor	www.st.com/bluenrg	BlueNRG device web page
STSW-BLUENRG-DK	STEVAL-IDB002V1 web page, Tools and Software section	BlueNRG DK SW package with reference demonstration applications
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.bluenrg	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
STEVAL-IDB002V1	www.st.com/bluenrg, Evaluation Tools section	STEVAL-IDB002V1 platform web page
UM1686 user manual	STEVAL-IDB002V1 web page, User Manual section	BlueNRG development kits user manual describing the reference demonstration applications

4   Reference information

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
12-Sep-2014	1	Initial release.
08-Apr-2016	2	Removed: • Figure 6 BlueNRG DK SW package structure & content.

IMPORTANT NOTICE – PLEASE READ CAREFULLY