

UM1788 User manual

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.

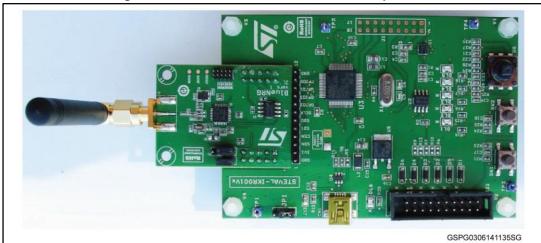


Figure 1: STEVAL-IDB002V1 Bluetooth® Smart platform

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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.

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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.

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Figure 3: Smartphone BlueNRG SensorApp acceleration notification



• 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



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.



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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 Specificatio n	https://www.bluetooth.org/en-us/specification/adopted-specifications	Bluetooth Low Energy specification web page
Smartphon e Android 4.3 Sensor App	https://play.google.com/store/apps/details?id=com.st.bluenrg	Android 4.3 BlueNRG Sensor App web page
Smartphon e 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

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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

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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.	

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