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# UM2071
# User manual

## BlueNRG-1 development kit

## Introduction

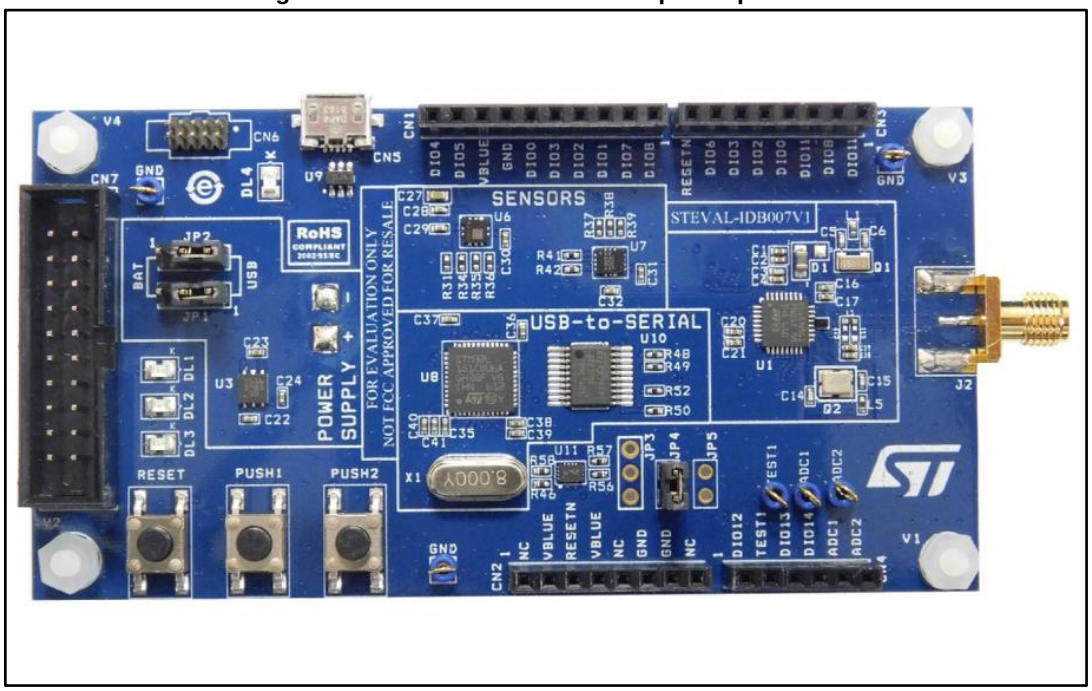
The BlueNRG-1 is a low power Bluetooth® smart system on chip, compliant with the Bluetooth® v4.2 specification and supporting master, slave and simultaneous master-and-slave roles.

The following BlueNRG-1 kits are available:

1. BlueNRG-1 development platform (order code: STEVAL-IDB007V1)

The STEVAL-IDB007V1 also provides a set of hardware resources for a wide range of application scenarios: sensor data (accelerometer, pressure and temperature sensor), remote control (buttons and LEDs) and debug message management through USB virtual COM. Three power options are available (USB only, battery only and external power supply plus USB) for high application development and testing flexibility.

**Figure 1: STEVAL-IDB007V1 development platform**



# Contents

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# 1 Getting started

## 1.1 Kit contents

The STEVAL-IDB007V1 kit includes:

- 1 BlueNRG-1 development platform
- 1 2.4 GHz Bluetooth antenna
- 1 USB cable

## 1.2 System requirements

The BlueNRG-1 Navigator and Flasher PC applications require:

- PC with Intel® or AMD® processor running one of the following Microsoft® operating systems:
  - Windows XP SP3
  - Windows Vista
  - Windows 7
- At least 128 MB of RAM
- USB ports
- At least 40 MB of available hard disk space
- Adobe Acrobat Reader 6.0 or later.

## 1.3 BlueNRG-1 development kit setup

After downloading the BlueNRG-1 DK software package (STSW-BLUENRG1-DK) from *www.st.com*, extract BlueNRG-1_DK-x.x.x-Setup.zip contents to a temporary directory, launch BlueNRG-1-DK-x.x.x-Setup.exe and follow the on-screen instructions.

EWARM Compiler 7.70 or later is required for building the BlueNRG1_DK_x.x.x demonstration applications.

Keil MDK-ARM and Atollic-True Studio toolchains are also supported.

# 2 Hardware description

## 2.1 STEVAL-IDB007V1 board overview

The BlueNRG-1 board in the STEVAL-IDB007V1 development kit lets you experiment with BlueNRG-1 system on chip functions. It features:

- Bluetooth® SMART board based on the BlueNRG-1 Bluetooth low energy system on chip
- Associated BlueNRG-1 development kit SW package including firmware and documentation
- Up to +8 dBm available output power (at antenna connector)
- Excellent receiver sensitivity (-88 dBm)
- Very low power consumption: 7.7 mA RX and 8.3 mA TX at -2 dBm
- Bluetooth® low energy v4.2 compliant, supports master, slave and simultaneous master-and-slave roles
- Integrated balun which integrates a matching network and harmonics filter
- SMA connector for antenna or measuring equipment
- 3 user LEDs
- 2 user buttons
- 3D digital accelerometer and 3D digital gyroscope
- MEMS pressure sensor with embedded temperature sensor
- Battery holder
- JTAG debug connector
- USB to serial bridge for providing I/O channel with the BlueNRG-1 device
- Jumper for measuring current for BlueNRG-1 only
- RoHS compliant

The following figure and table describe physical sections of the board.

**Figure 2: STEVAL-IDB007V1 board components**

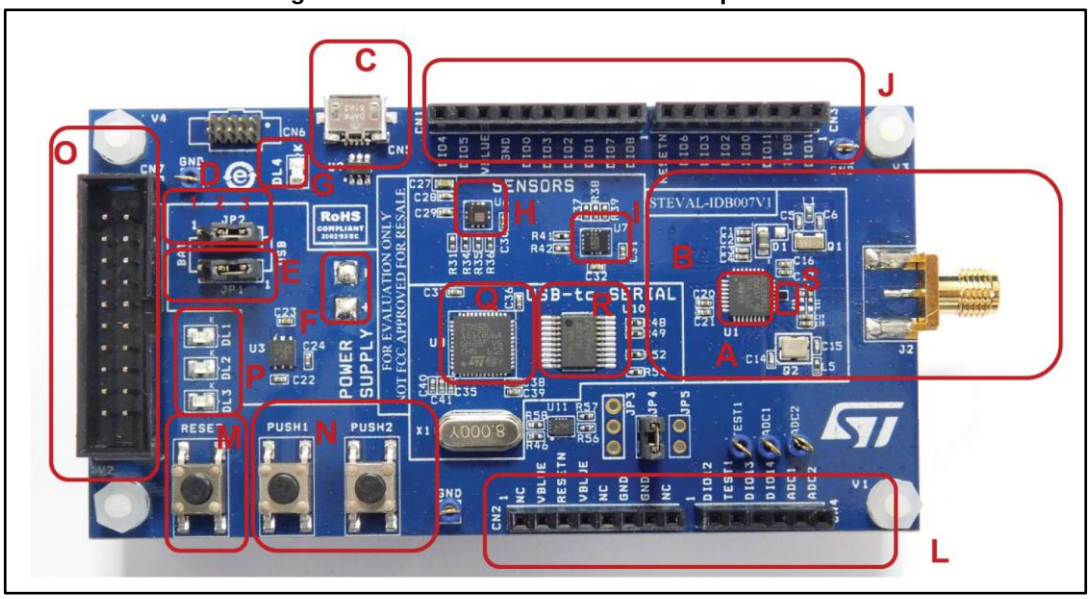


**Table 1: STEVAL-IDB007V1 board component descriptions**

| Region | Description |
|---|---|
| A | BlueNRG-1 system on chip |
| C | Micro USB connector for power supply and I/O |
| O | JTAG connector |
| M | RESET button |
| N | two USER buttons |
| H | LPS25HB MEMS pressure sensor with embedded temperature |
| I | LSM6DS3 3D digital accelerometer and 3D digital gyroscope |
| G | PWR LED |
| P | three user LEDs |
| back of the PCB | battery holder for two AAA batteries |
| J, L | Two rows of Arduino-compliant connectors |
| S | Integrated balun with matching network and harmonics filter |
| Q | STM32L151CBU6 48-pin microcontroller (USB to serial bridge for I/O channel to PC communication)(1) |
| R | ST2378E level translator to adapt voltage level between STM32 and BlueNRG-1 |

**Notes:**

(1)STM32 is not intended to be programmed by users

## 2.2 BlueNRG-1 SoC connections

The BlueNRG-1 very low power Bluetooth low energy (BLE) single-mode system on chip (*Figure 2: "STEVAL-IDB007V1 board components"* – region A) has 160 KB of Flash, 24 KB of RAM, a 32-bit core ARM cortex-M0 processor and several peripherals (ADC, GPIOs, I²C, SPI, Timers, UART, WDG and RTC).

The microcontroller is connected to various components such as buttons, LEDs and sensors. The following table describes the microcontroller pin functions.

**Table 2: BlueNRG-1 pin description with board functions**

| Pin name | Pin No | Board function | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | LED | Micro | Button | Pressure sensor | 3D accelerometer and gyroscope | JTAG | Arduino connectors | | | |
| | | | | | | | | CN1 | CN2 | CN3 | CN4 |
| DIO10 | 1 | | | | | | JTMS-SWTDIO | | | | |
| DIO9 | 2 | | | | | | JTCK-SWTCK | | | | |
| DIO8 | 3 | | TXD (PA2) | | | | | pin 1 IO8 | | pin 2 TX | |

| Pin name | Pin No | Board function | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | LED | Micro | Button | Pressure sensor | 3D accelerometer and gyroscope | JTAG | Arduino connectors | | | |
| | | | | | | | | CN1 | CN2 | CN3 | CN4 |
| DIO7 | 4 | DL2 | | | | | | pin 2 IO9 | | | pin 6 SCL |
| DIO6 | 5 | DL1 | | | | | | | | pin 7 IO6 | pin 5 SDA |
| VBAT3 | 6 | | | | | | | | | | |
| DIO5 | 7 | | | | SDA PUSH2 button | | | pin 9 SDA | | | |
| DIO4 | 8 | | | | SCL | | | pin 10 SCL | | | |
| DIO3 | 9 | | | | | SDO/SA0 | | pin 5 MISO | | pin 6 IO5 | |
| DIO2 | 10 | | | | | SDA | | pin 4 MOSI | | pin 5 IO4 | |
| DIO1 | 11 | | | | | CS | JTAG-TDO | pin 3 CS | | | |
| DIO0 | 12 | | | | | SCL | JTAG-TDI | pin 6 SCK | | pin 4 IO3 | |
| ANATEST0/DIO14 | 13 | DL3 | | | | | | | | | pin 4 AD3 |
| ANATEST1 | 14 | | | | | | | | | | |
| ANATEST2 | 15 | | | | | | | | | | |
| ANATEST3 | 16 | | | | | | | | | | |
| FXTAL1 | 17 | | | | | | | | | | |
| FXTAL0 | 18 | | | | | | | | | | |
| VBAT2 | 19 | | | | | | | | | | |
| RF1 | 20 | | | | | | | | | | |
| RF0 | 21 | | | | | | | | | | |
| SXTAL1 | 22 | | | | | | | | | | |
| SXTAL0 | 23 | | | | | | | | | | |
| VBAT1 | 24 | | | | | | | | | | |
| RESET | 25 | | RESET | RESET | | | RESET | | pin 3 NRST | pin 8 IO7 | |
| SMPSFILT1 | 26 | | | | | | | | | | |
| SMPSFILT2 | 27 | | | | | | | | | | |

| Pin name | Pin No | Board function | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | LED | Micro | Button | Pressure sensor | 3D accelerometer and gyroscope | JTAG | Arduino connectors | | | |
| | | | | | | | | CN1 | CN2 | CN3 | CN4 |
| VDD1V2 | 28 | | | | | | | | | | |
| DIO13 | 29 | | | PUSH1 | | | | | | | pin 3 AD2 |
| DIO12 | 30 | | | | | INT1 | | | | | pin 1 AD0 |
| FTEST | 31 | | | | | | | | | | |
| DIO11 | 32 | | RXD PA3 | | | | | | | pin 1 RX pin 3 IO2 | pin 2 AD1 |

The board section labeled BLUENRG-1 (*Figure 2: "STEVAL-IDB007V1 board components"* – region B) includes the following main components:

- BlueNRG-1 low power system on chip (in a QFN32 package)
- High frequency 16 MHz crystal
- Low frequency 32 kHz crystal for the lowest power consumption
- Integrated balun which integrates a matching network and harmonics filter
- SMA connector

For more details, see *Figure 24: "STEVAL-IDB007V1 BlueNRG-1"*

## 2.3 Power supply

Green LED DL4 (*Figure 2: "STEVAL-IDB007V1 board components"* – region G) signals the board is being powered, either via:

- micro USB connector CN5 (*Figure 2: "STEVAL-IDB007V1 board components"* – region C)
- two AAA batteries (region F)
- an external DC power supply plus micro USB connector

The following table describes the power supply modes available on the STEVAL-IDB007V1 board and corresponding jumper settings.

**Table 3: STEVAL-IDB007V1 kit platform power supply modes**

| Power supply mode | JP1 | JP2 | Comment |
|---|---|---|---|
| 1 - USB | Fitted: 1-2 | Fitted: 2-3 | USB supply through connector CN5 (*Figure 2: "STEVAL-IDB007V1 board components"* – region C) |
| 2 - Battery | Fitted: 2-3 | Fitted: 1-2 | The supply voltage must be provided through battery pins (region F). |
| 3 - Combo | Fitted: 1-2 | Optional | USB supply through connector CN5 for STM32L1; JP2 pin 2 external power for BlueNRG-1 |

## 2.4 Jumpers

The following jumpers are available:

**Table 4: STEVAL-IDB007V1 kit platform jumpers**

| Jumper | Description |
|---|---|
| **JP1** | 1-2: to provide power from USB (JP2: 2-3)<br>2-3: to provide power from battery holder (JP2: 1-2) |
| **JP2** | 1-2: to provide power from battery holder (JP1: 2-3)<br>2-3: to provide power from USB (JP1: 1-2)<br>JP2 pin 2 to VDD to provide external power supply to BlueNRG-1 (JP1: 1-2) |
| **JP3** | pin 1 and 2 UART RX and TX of MCU<br>pin 3 GND |
| **JP4** | Fitted: to provide VBLUE to BlueNRG-1. It can be used also for current measurement. |
| **JP5** | Fitted: TEST pin to VBLUE<br>Not fitted: TEST pin to GND |

## 2.5 Sensors

The following sensors are available on the platform:

1. An LPS25HB (*Figure 2: "STEVAL-IDB007V1 board components"* – region H) is a piezoresistive absolute pressure sensor which functions as a digital output barometer. The device comprises a sensing element and an IC interface which communicates through I²C from the sensing element to the application.
2. An LSM6DS3 3D (region I) digital accelerometer and 3D digital gyroscope with embedded temperature sensor which communicates via SPI interface. One line for interrupt is also connected.

## 2.6 Extension connector

BlueNRG-1 signal test points are shared on two Arduino-compliant connector rows: CN1, CN3 (*Figure 2: "STEVAL-IDB007V1 board components"* – region J) and CN2, CN4 (region L). See *Table 2: "BlueNRG-1 pin description with board functions"*.

## 2.7 Push-buttons

The board has one user button to reset the microcontroller (*Figure 2: "STEVAL-IDB007V1 board components"* – region M) and two further buttons for application purposes (region N).

## 2.8 JTAG connector

A JTAG connector (*Figure 2: "STEVAL-IDB007V1 board components"* – region O) allows BlueNRG-1 microcontroller programming and debugging with an in-circuit debugger and programmer such as ST-LINK/V2.

Only SWD mode is supported

## 2.9 LEDs

LEDs DL1 (yellow), DL2 (red), DL3 (blue) and DL4 (green, power LED) are available on the board (*Figure 2: "STEVAL-IDB007V1 board components"* – regions G and P).

## 2.10 STM32L151CBU6 microcontroller

The most important feature of the STM32L151CBU6 48-pin microcontroller (*Figure 2: "STEVAL-IDB007V1 board components"* – regions Q) is the USB to serial bridge providing an I/O channel with the BlueNRG-1 device.

The microcontroller is connected to the BlueNRG-1 device through an ST2378E level translator (region R).

The STM32L microcontroller on the board is not intended to be programmed by users. ST provides a pre-programmed firmware image for the sole purpose of interfacing BlueNRG-1 to a USB host device (e.g., a PC).

## 2.11 Current measurements

To monitor the power consumption of the BlueNRG-1 only, remove the jumper from JP4 and insert an ammeter between pins 1 and 2 of the connector (when the power is ON, remove the USB connection).

Since power consumption of the BlueNRG-1is usually very low, an accurate instrument in the range of few micro amps is recommended.

## 2.12 Hardware setup

1. Connect an antenna to the SMA connector
2. Configure the board to USB power supply mode as per the jumper settings in *Table 3: "STEVAL-IDB007V1 kit platform power supply modes"*
3. Connect the board to a PC via USB cable (connector CN5)
4. Verify the power indication LED DL4 is on.

# 3 BlueNRG-1 Navigator

BlueNRG-1 Navigator is a user friendly GUI which lets you select and run demonstration applications easily, without requiring any extra hardware. With it, you can access the following BlueNRG-1 DK software package components:

- BlueNRG-1 Bluetooth low energy (BLE) demonstration applications
- BlueNRG-1 peripheral driver examples
- BlueNRG-1 development kits
- release notes
- license files

With BlueNRG-1 DK Navigator, you can directly download and run the selected prebuilt application binary image (BLE examples or peripheral driver example) on the BlueNRG-1 platform without a JTAG interface.

The interface gives demo descriptions and access to board configurations and source code if needed.

You can run the utility through the BlueNRG-1 Navigator icon under: Start → STMicroelectronics → BlueNRG -1 DK X.X.X → BlueNRG-1 Navigator

**Figure 3: BlueNRG-1 Navigator**


## 3.1 BlueNRG-1 Navigator 'Demonstration Applications'

You can navigate the menus for the reference/demo application you want to launch. For each application, the following information is provided:

- Application settings (if applicable)
- Application description
- Application hardware related information (e.g., LED signals, jumper configurations, etc.)

The following functions are also available for each application:

- **Flash**: to automatically download and run the available prebuilt binary file to a BlueNRG-1 platform connected to a PC USB port.

- **Doc**: to display application documentation (html format)
- **Project**: to open the project folder with application headers, source and project files.

The figure below shows you how to run the BLE Beacon demo application; the other demos function similarly.

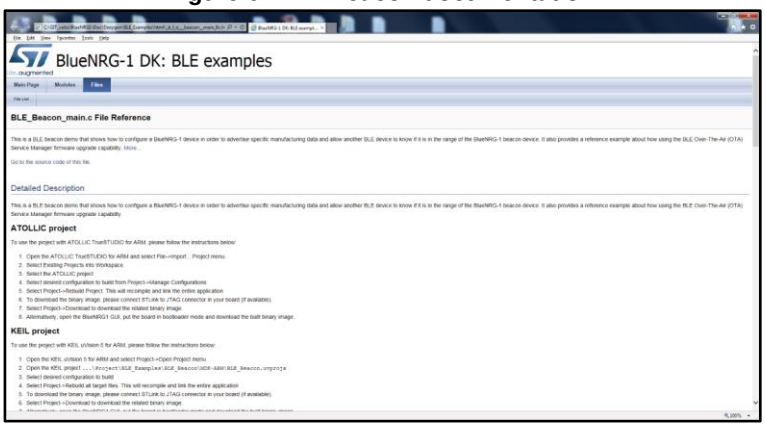
**Figure 4: BLE Beacon application**


When a BlueNRG-1 platform is connected to your PC USB port, you can press the “Flash & Run” tab on the selected application window to download and run the available prebuilt application binary image on the BlueNRG-1 platform.

**Figure 5: BLE Beacon Flash programming**


Selecting the “Doc” tab opens the relative html documentation.

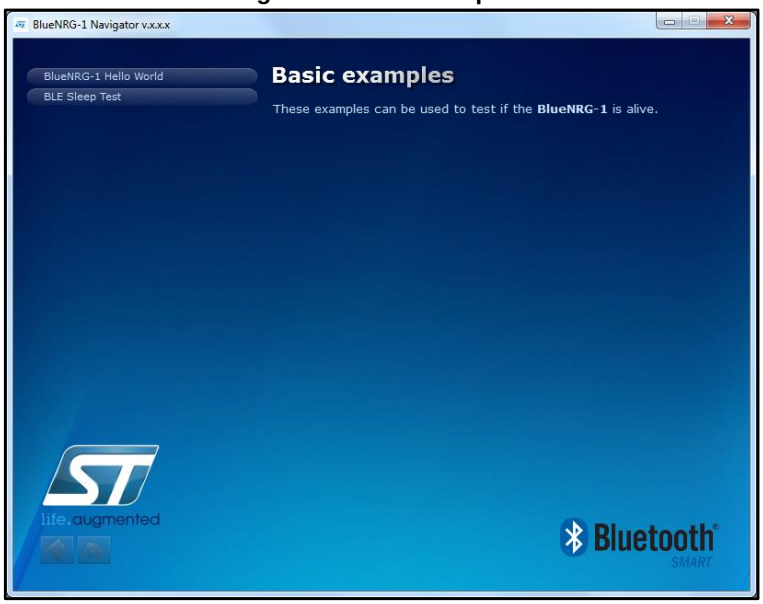
**Figure 6: BLE Beacon documentation**




### 3.1.1 BlueNRG-1 Navigator 'Basic examples'

This page lists some basic sample applications for the BlueNRG-1 device to verify that BlueNRG-1 device is alive as well as the device sleep and wakeup modes.

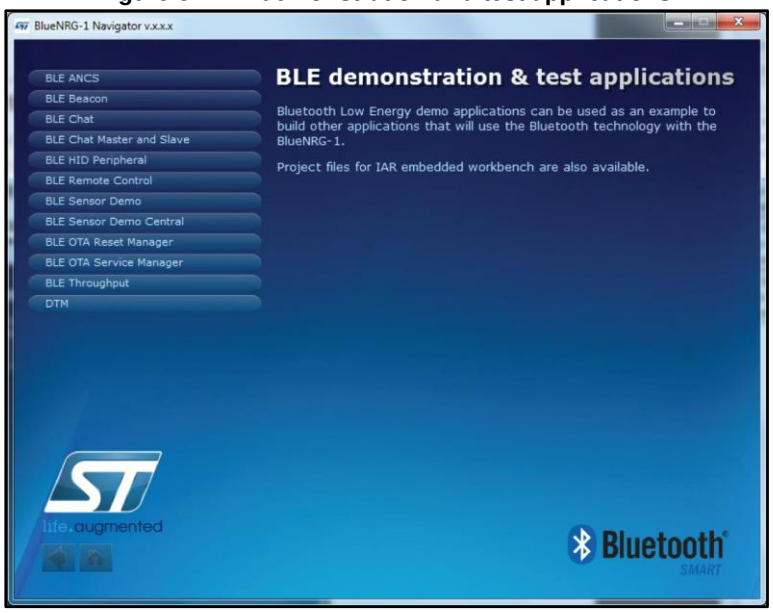
**Figure 7: Basic examples**




### 3.1.2 BlueNRG-1 Navigator 'BLE demonstration and test applications'

This page lists all the available Bluetooth low energy (BLE) demonstration applications in the BlueNRG-1 DK software package. These applications provide usage examples of the BLE stack features for the BlueNRG-1 device.

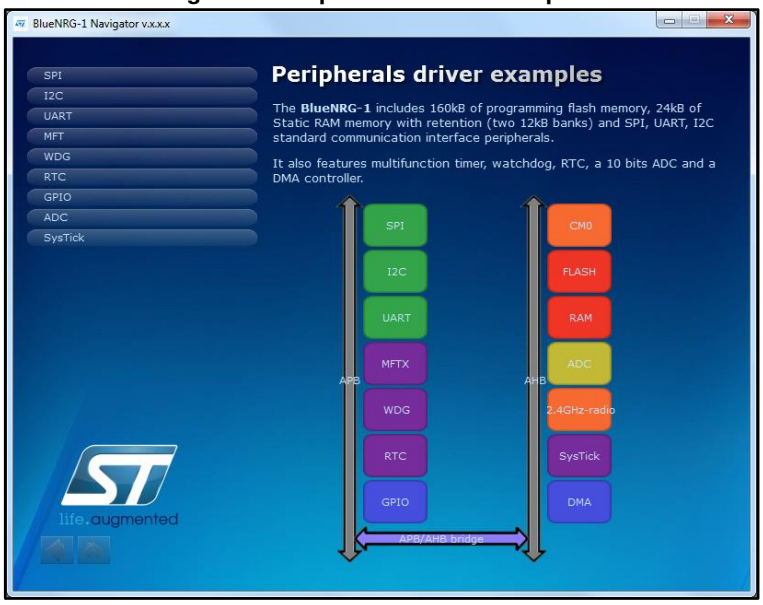
**Figure 8: BLE demonstration and test applications**




### 3.1.3 BlueNRG-1 Navigator ‘Peripherals driver examples’

This page lists the available BlueNRG-1 peripherals and corresponding test applications to work with certain features specific to the selected BlueNRG-1 peripheral.

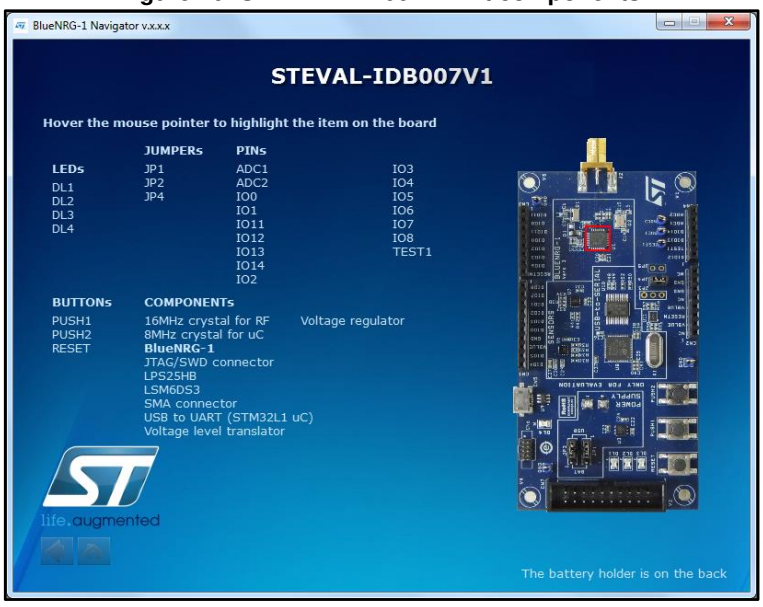
**Figure 9: Peripherals driver examples**




## 3.2 BlueNRG-1 Navigator ‘Development Kits’

This window displays the available BlueNRG-1 DK Kit platforms and corresponding resources. When you hovers the mouse pointer over a specific item, the related component is highlighted on the board.

**Figure 10: STEVAL-IDB007V1 Kit components**




### 3.2.1 BlueNRG-1 Navigator ‘Release Notes’ and ‘License’

As their name suggests, these pages display the BlueNRG-1 DK SW package Release Notes (html format) and the BlueNRG-1 DK software package license file, respectively.

# 4 BlueNRG-1 Flasher utility

The BlueNRG-1 Flasher utility allows BlueNRG-1 programming using the UART bootloader.

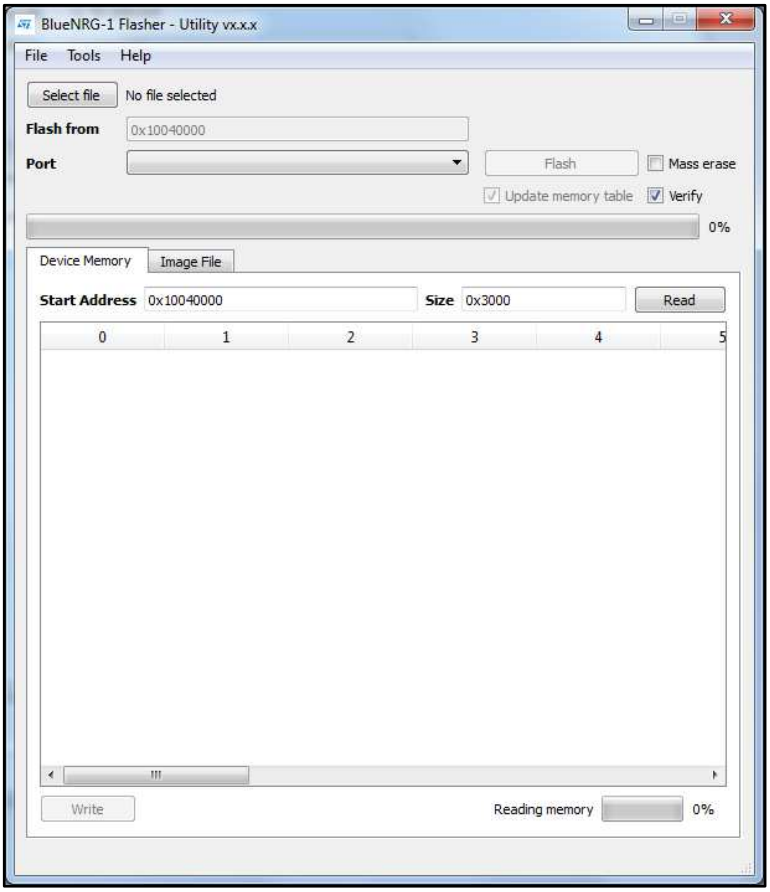
## 4.1 System requirements and installation

The BlueNRG-1 Flasher utility PC configuration requires the following minimum characteristics

- A PC with USB port running Windows® XP or Windows® 7
- 256 MB RAM
- 30 MB free hard disk space

You can run this utility by clicking on the BlueNRG-1 Flasher icon under: Start → STMicroelectronics → BlueNRG -1 DK X.X.X → BlueNRG1 Flasher

**Figure 11: BlueNRG-1 Flasher utility**



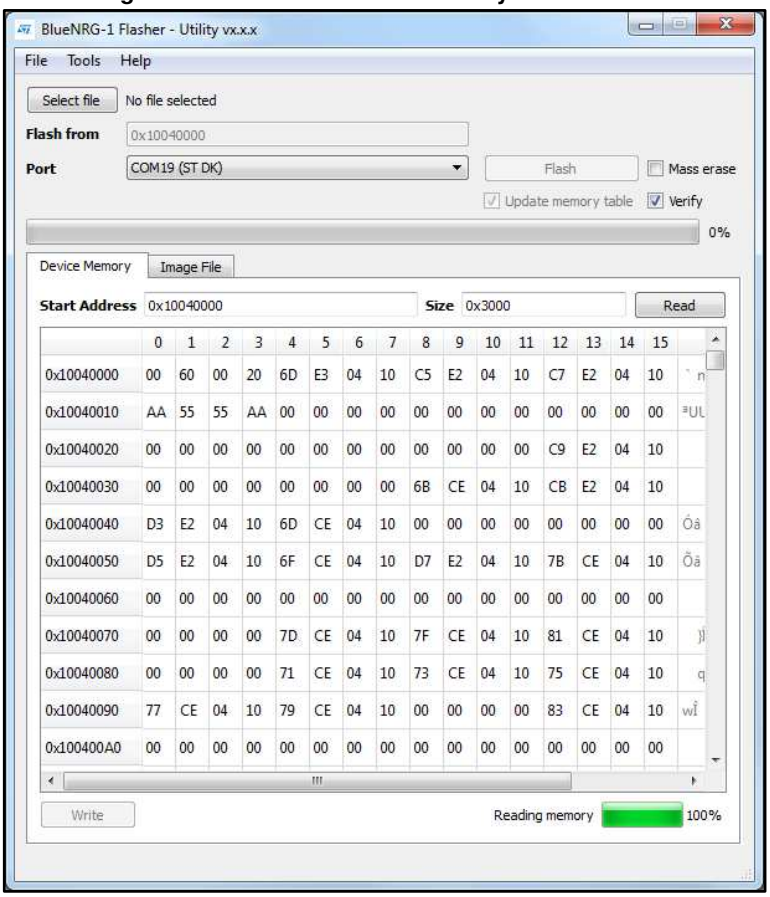

## 4.2 Main user interface window

In the upper section of the BlueNRG-1 Flasher – Utility main window, you can:

- select the image file (‘Select file’ button)
- choose the flashing address (‘Flash from’ text input bar, only enabled for .bin files)
- select the COM port to be used to interface the device (‘Port’ dropdown list)

The BlueNRG-1 device memory is read when the associated COM port is opened.

**Figure 12: BlueNRG-1 Flasher utility main window**




### 4.2.1 Main menu items

From the ‘File’ menu, you can:

- Load an existing .bin or .hex (Intel extended) file.
- Save the current memory image in a .bin file. The start address and the size of the memory section to be saved to file are selectable from the ‘Device Memory’ tab.
- Close the application.

From the ‘Tools’ menu, you can mass erase all the device Flash memory.

### 4.2.2 Image file selection

Use the ‘Select file’ button on the main page (or the File>Load menu) to load an existing .bin or .hex file. The full path of the selected file appears next to the button and the ‘Flash’ becomes active.

**Figure 13: BlueNRG-1 Flasher utility file selection**


By default, the ‘Mass erase’ option beside the ‘Flash’ button is not checked, and only the required memory pages are erased and written with the file content. When this option is checked, the memory flash phase is preceded by a full mass erase.

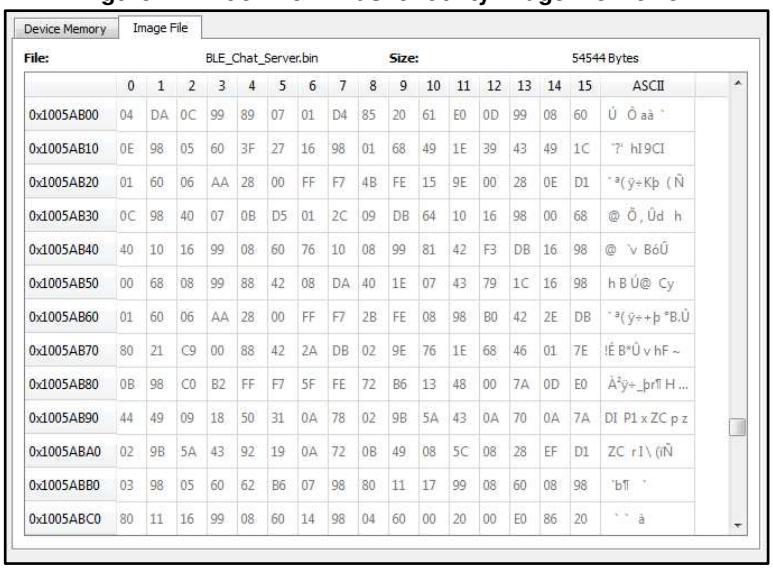
The ‘Verify’ option forces a check to ensure that the memory content has been written correctly.

Check the ‘Update memory table’ option to update the ‘Device Memory’ table after the flashing operation. This option is automatically checked when the ‘Verify’ checkbox is selected.

### 4.2.3 ‘Image File’ tab

The selected file name, size and parsed contents to be flashed to device memory can be viewed in the ‘Image File’ tab.

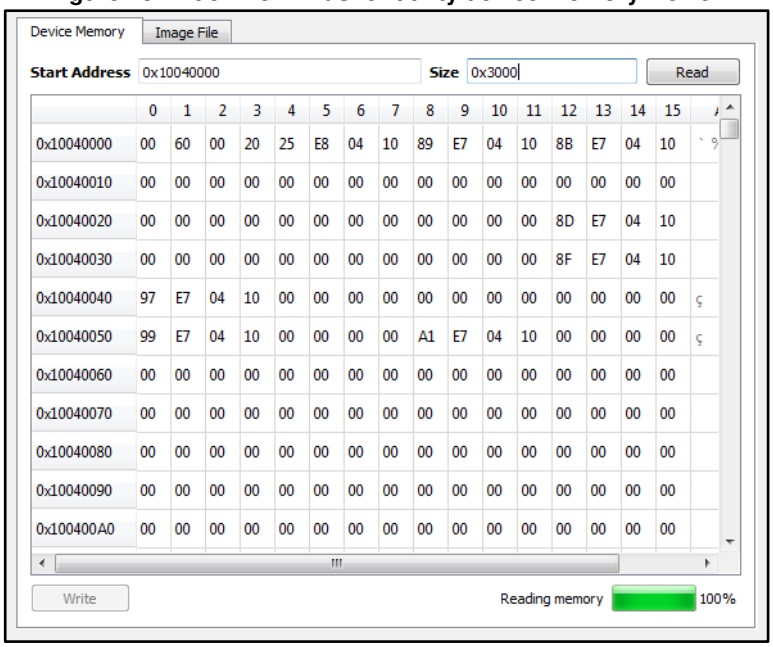
**Figure 14: BlueNRG-1 Flasher utility image file viewer**




### 4.2.4 ‘Device Memory’ tab

Select this tab to view the memory contents of a connected device.

**Figure 15: BlueNRG-1 Flasher utility device memory viewer**



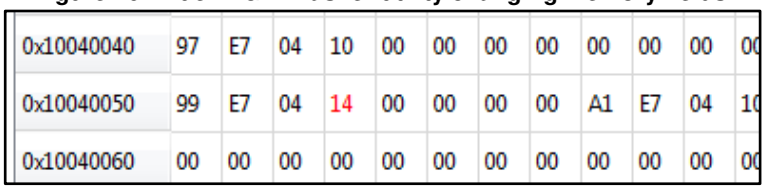

Click the ‘Read’ button to transfer the memory segment defined by ‘Start Address and ‘Size’ into the table.

The first column gives the base address of the following 16 bytes in a row (e.g., row 0x10040050, column 4 holds the hexadecimal byte value at 0x10040054.

You can change byte values by double-clicking a cell and entering a new hexadecimal value; edited bytes appear in red.

Click the ‘Write’ button to flash the entire page with the new byte values into device memory.

**Figure 16: BlueNRG-1 Flasher utility changing memory fields**




### 4.2.5 Using BlueNRG-1 Flasher utility with other boards

The BlueNRG-1 Flasher – Utility automatically detects BlueNRG-1 evaluation boards like STEVAL-IDB007V1 and uses an auxiliary STM32 to (driven by the GUI) to reset the BlueNRG-1 and put it into bootloader mode.

The application also works with custom boards providing simple UART access to the BlueNRG-1 device, but you must put the device in bootloader mode manually. Upon the selection of any non-STEVAL COM port, the following popup appears.

**Figure 17: BlueNRG-1 Flasher utility 'Comport Setting' popup**


When this popup appears, set the BlueNRG-1 pin DIO7 high and reset the BlueNRG-1 device (keeping the DIO7 high); the device should now be in bootloader mode.

You can also set a preferred Baudrate for the UART in the popup window and then press OK to return to the GUI.

Avoid resetting the device while using the BlueNRG-1 Flasher utility unless the Comport Setting popup is active. If the device is reset, you must toggle the COM port to use the Flasher utility again.

# 5 Programming with BlueNRG-1 system on chip

The BlueNRG-1 Bluetooth low energy (BLE) stack is provided as a binary library. A set of APIs to control BLE functionality. Some callbacks are also provided for user applications to handle BLE stack events. The user is simply requested to link this binary library to his or her application and use the relevant APIs to access BLE functions and complete the stack event callbacks to manage responses according to application requirements.

A set of software driver APIs is also included for accessing the BlueNRG-1 SoC peripherals and resources (ADC, GPIO, I²C, MFTX, Micro, RTC, SPI, SysTick, UART and WDG).

The development kit software includes sample code demonstrating how to configure BluenRG-1 and use the device peripherals and BLE APIs and event callbacks. Documentation on the BLE APIs, callbacks, and peripheral drivers are provided in separate documents.

## 5.1 Software directory structure

The BlueNRG-DK software package files are organized in the following directories:

- **Application**: containing BlueNRG-1 Navigator and Flasher PC applications.
- **Doc**: with doxygen BLE APIs and events, BlueNRG-1 peripheral drivers, BLE demo applications, BlueNRG-1 Peripheral examples, BlueNRG-1 SDK and HAL driver documentation, DK release notes and license file.
- **Firmware**: with prebuilt binary BLE and peripheral driver sample applications.
- **Library**
  - **Bluetooth LE**: Bluetooth low energy stack binary library and all the definitions of stack APIs, stack events callbacks and constants. Over-the-air Bluetooth low energy firmware upgrade support.
  - **BlueNRG1_Periph_Driver**: BlueNRG-1 drivers for device peripherals (ADC, clock, DMA, Flash, GPIO, I²C, timers, RTC, SPI, UARR and watchdog).
  - **CMSIS**: BlueNRG-1 CMSIS files.
  - **SDK_Eval_BlueNRG1**: SDK drivers providing an API interface to the BlueNRG-1 platform hardware resources (LEDs, buttons, sensors, I/O channel).
  - **HAL**: Hardware abstraction level APIs for abstracting certain BlueNRG-1 hardware features (sleep modes, clock based on SysTick, etc.).
- **Project**
  - **BLE_Examples**: Bluetooth low energy demonstration application including Headers, source files and EWARM, Keil and Atollic project files.
  - **BlueNRG1_Periph_Examples**: with sample applications for the BlueNRG-1 peripherals and hardware resources, including Headers, source files and project files.
- **Utility**: contains some utilities

# 6 BlueNRG-1 beacon demonstration application

The BlueNRG-1 beacon demo is supported by the BlueNRG-1 development platform (STEVAL-IDB007V1). It demonstrates how to configure a BlueNRG-1 device to advertise specific manufacturing data and allow another BLE device to determine whether it is in BlueNRG-1 BLE beacon device range.

## 6.1 BLE Beacon application setup

This section describes how to configure a BlueNRG-1 device to act as a beacon device.

### 6.1.1 Initialization

The BlueNRG-1 BLE stack must be correctly initialized thus:

```
aci_gatt_init();

aci gap init(GAP PERIPHERAL ROLE, 0, 0x08, &service handle, &dev name char handle,
&appearance_char_handle);
```

See the BlueNRG-1 BLE stack documentation for more information on these and following commands.

### 6.1.2 Define advertising data

The BLE Beacon application advertises the following manufacturing data:

**Table 5: BlueNRG-1 Beacon advertising manufacturing data**

| Data field | Description | Notes |
|---|---|---|
| Company identifier code | SIG company identifier(1) | Default is 0x0030 (STMicroelectronics) |
| ID | Beacon ID | Fixed value |
| Location UUID | Beacons UUID | Used to distinguish specific beacons from others |
| Major number | Identifier for a group of beacons | Used to group a related set of beacons |
| Minor number | Identifier for a single beacon | Used to identify a single beacon |
| Tx Power | 2's complement of the Tx power | Used to establish how far you are from device |

**Notes:**

(1)available at: https://www.bluetooth.org/en-us/specification/assigned-numbers/company-identifiers

### 6.1.3 Entering non-connectable mode

The BLE Beacon device uses the GAP API command to enter non-connectable mode thus:

```
aci_gap_set_discoverable(ADV_NONCONN_IND, 160, 160, PUBLIC_ADDR,
                         NO_WHITE_LIST_USE,0, NULL, 0, NULL, 0, 0);
```

To advertise the specific selected manufacturer data, the BLE Beacon application can use the following GAP APIs:

```
/* Remove TX power level field from the advertising data: it is necessary     to
have enough space for the beacon manufacturing data */

aci_gap_delete_ad_type(AD_TYPE_TX_POWER_LEVEL);
```